PROVINCE OF BRITISH COLUMBIA

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DEPARTMENT OF LANDS

HON. A. W. GRAY, *Minister.*

H. CATHCART, *Deputy Minister.* E. C. MANNING, *Chief Forester.*

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# REPORT

OF

# THE FOREST BRANCH

FOR THE

YEAR ENDED DECEMBER 31ST

1938

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1939.

VICTORIA, B.C., February 28th, 1939.

*To His Honour* E. W. HAMBER,
*Lieutenant-Governor of the Province of British Columbia.*

MAY IT PLEASE YOUR HONOUR:

Herewith I beg respectfully to submit the Annual Report of the Forest Branch of the Department of Lands for the year 1938.

A. W. GRAY,
*Minister of Lands.*

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*The Hon. A. W. Gray,*
*Minister of Lands, Victoria, B.C.*

SIR,—There is submitted herewith the Annual Report on activities of the Branch during the calendar year 1938.

E. C. MANNING,
*Chief Forester.*

# REPORT OF THE FOREST BRANCH.

Business reviews of the past few years have not uncommonly deplored the late depression, expressed regret over the failure to attain the normal conditions of 1929, and noted with restrained enthusiasm the current improvements. More recently a few well-qualified observers have been suggesting that we deceive ourselves and cloud the prospect by persisting in holding the *abnormal* inflated conditions of 1929 for ever before us as a standard for comparison and that business conditions during the past three years have, in actual fact, been normal or better than normal.

However bank clearings, loadings, laboriously derived indices, and the thousand other indicators may be interpreted by the economists, it is safe to say that it would be a good tonic to accept this latter point of view.

Appraised on its own merits, then, the year 1938 in the local world of forestry and forest industry presents a reasonably well-balanced account.

Against a disastrous fire season we can enter some important advances in protection organization and technique; against wars, debased exchange, trade treaty negotiations, and other depressive factors, a surprisingly well-sustained export trade under "normal" ocean freight conditions; against a receding and less accessible supply of old-growth fir, a growing market for cedar and hemlock; and against unsatisfactory prices, rather well-filled order files and, perhaps more important still, a growing realization that these unsatisfactory prices are in some considerable measure of our own making.

| | 1929. | 1936. | 1937. | 1938. | Average, Ten Years to 1938. |
|---|---|---|---|---|---|
| | (Nearest 1,000—add 000.) | | | | |
| Log-scale, F.B.M. | 2,940,308 | 2,823,758 | *3,035,553* | 2,581,279 | 2,302,481 |
| Hewn railway-ties, pieces | 3,526 | 1,325 | 1,191 | 1,118 | 1,565 |
| Cords | 153 | 171 | 155 | 171 | 167 |
| Poles, piles, lin. ft. | *39,489* | 14,269 | 22,116 | 16,549 | 17,245 |
| Converted total scale, F.B.M. | *3,346,144* | 3,020,773 | 3,241,916 | 2,779,034 | 2,537,414 |
| Water-borne export | 801,518 | *1,202,994* | 1,107,377 | 1,192,196 | 900,545 |

* Italics indicate record scales.

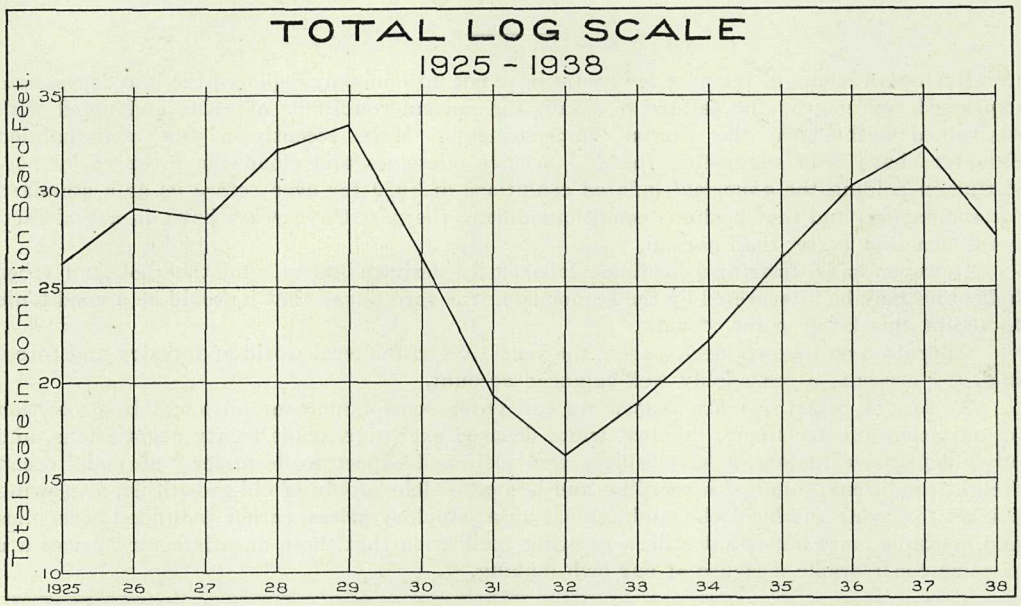
The Coast logging-year opened under the usual handicap of difficult seasonal weather conditions, aggravated each year by the small, but accumulating, effect of receding timber frontiers. A slight difference in elevation makes a marked difference in snow conditions on the Lower Coast where the bulk of the log production has for some years been concentrated, and as long-established operations work up the valleys and slopes snow has an ever-increasing effect on winter operation.

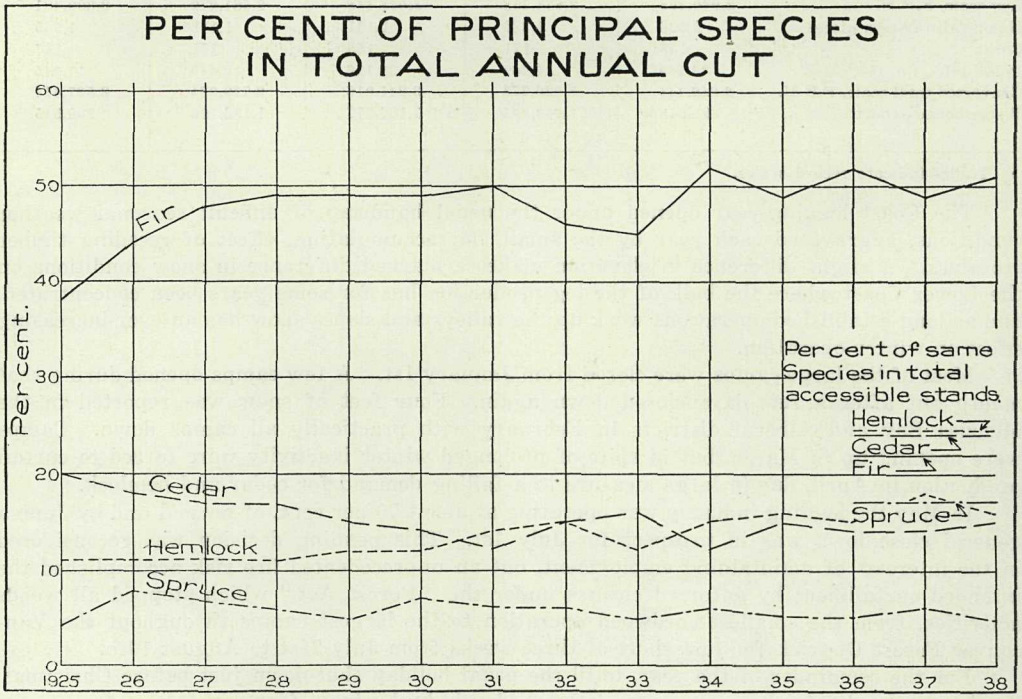
Most of the large camps were closed from January 1st. A few camps opened during that month but after a few days closed down again. Four feet of snow was reported in the Menzies Bay and Alberni districts in February with practically all camps down. Camps were opening up in March, but in spite of prolonged winter inactivity were forced to curtail production in April, due in large measure to a failing demand for cedar and hemlock.

In May the logging industry was operating at about 70 per cent. of normal and by June a general close-down was in prospect for July 1st. This pending decision was reconsidered in the interests of maintaining employment, but an unprecedented fire risk accomplished the intended curtailment by enforced closure under the "Forest Act" which stopped all woods activities, from the smallest cordwood operation to the largest camps throughout the Vancouver Forest District, for just short of three weeks from July 21st to August 10th.

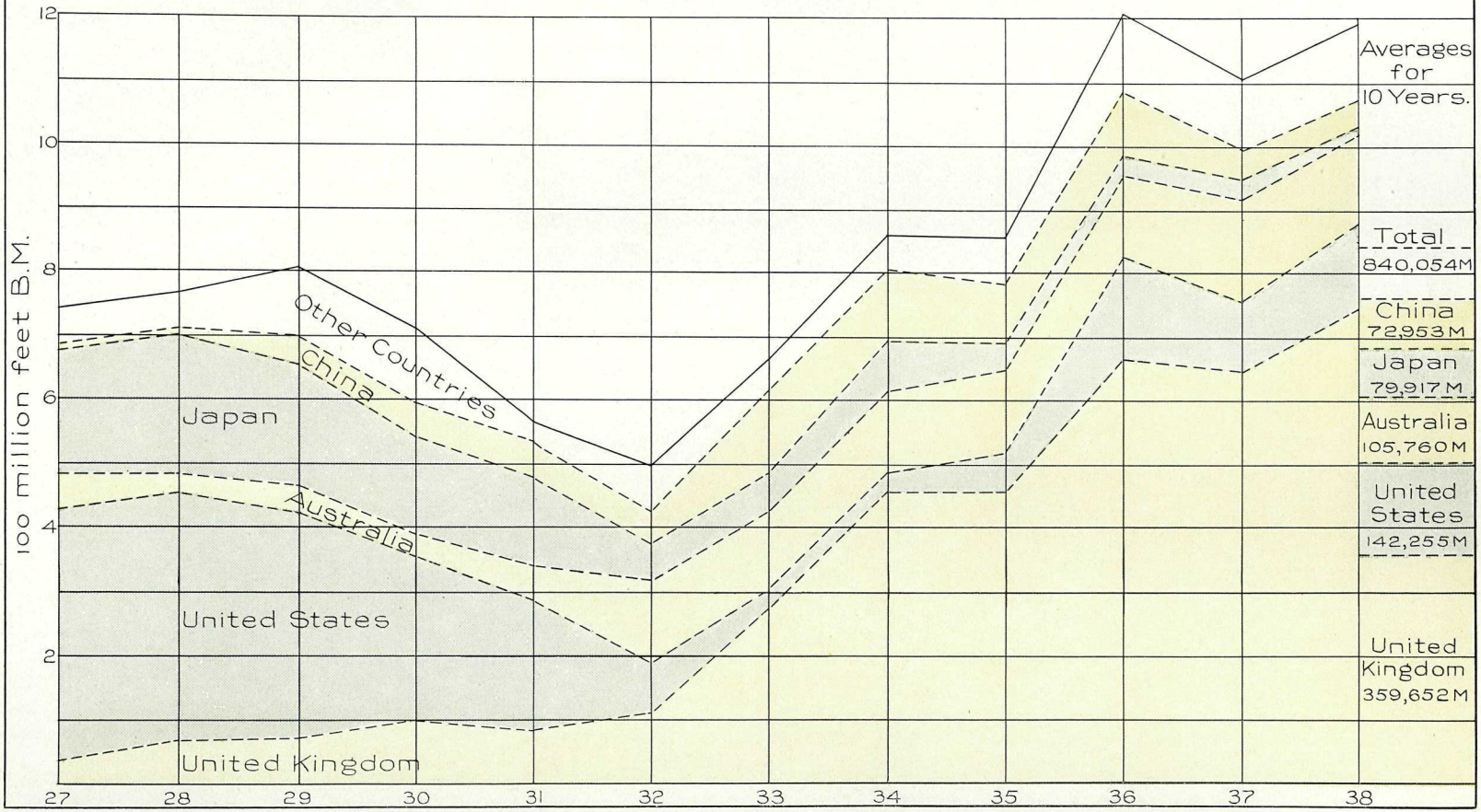
For the remainder of the year, until the usual holiday shut-down just before Christmas, logging pursued a fairly even course, influenced only by business factors.

In the logging world the year 1938 established no peaks and plumbed no new depths. If it was hardly good enough to characterize as "normal," at least there were no disastrous


TOTAL LOG SCALE
1925 - 1938
Total scale in 100 million Board Feet.
35
30
25
20
15
10
1925
26
27
28
29
30
31
32
33
34
35
36
37
38


PER CENT OF PRINCIPAL SPECIES
IN TOTAL ANNUAL CUT
Per cent.
60
50
40
30
20
10
0
Fir
Cedar
Hemlock
Spruce
Per cent of same
Species in total
accessible stands.
Hemlock
Cedar
Fir
Spruce
1925
26
27
28
29
30
31
32
33
34
35
36
37
38

# TOTAL WATER-BORNE EXPORT OF LUMBER AND PROPORTIONS ABSORBED BY PRINCIPAL MARKETS 1927 - 1938



breaks in prices, no extreme embarrassment in surplus stocks, and no labour disputes to add discouragement to a somewhat curtailed production.

Total log-scale, which is detailed elsewhere in this report, reached a figure of 2,779,033,998 F.B.M., 16.9 per cent. below the record year and 14.2 per cent. below the 1937 total. Of this total scale:—

| | Per Cent. |
|---|---|
| Douglas fir constituted | 51 |
| Cedar | 15 |
| Hemlock | 15 |
| Spruce | 5 |
| Other species | 14 |

Indicating a continued serious lack of balance between occurrence and utilization.

In the lumber industry the year was remarkable for its recurrent threats of complete disaster and their failure to materialize. On the whole it exemplified remarkably well the old philosopher's homely remark that he had had a lot of trouble in his life but most of it had never happened. The days before the Munich pact gave some indication of what we might expect in the event of actual war. Marking regulations, of short duration, threatened our attenuated trade with the United States and forecast the length to which nuisance restrictions could be extended. The trade-treaty negotiations between Great Britain, the United States, and Canada were fraught with disquieting possibilities of loss of our best market, developed with so much foresight and at so much cost in funds and labour. Apart from the imminent possibility of actual war, the trade treaty was perhaps the outstanding feature of the year. The treaty has been so thoroughly reported and discussed that it hardly seems necessary to enter into any extended comment here. Suffice it to say, in words borrowed from a recent editorial, " So far as probable trade results are concerned, the more we study the details of the agreements, and the comments of those whose produce will be affected, the more we doubt our own competence to pass judgment or to prognosticate. The only thing we feel reasonably sure about is that the outcome will not be so mutually profitable as the optimists hope, nor so dismal as the pessimists fear."*

In terms of actual business done, the Eastern Canadian market fell off between 15 and 20 per cent., Prairie markets failed once more to materialize as predicted, and the United States quota in fir and hemlock was only little more than half filled; but the overseas market, especially in Great Britain, held up remarkably well. Prices were somewhat weak, but opinion is not lacking that this most unfortunate factor can be laid in some measure at our own door. Particularly disquieting in this respect is British comment, of which the following brief extract from a leading British trade journal may be taken as a sample: ". . . At present the price situation is largely controlled by competition, which continues as ever to be very keen between big exporting interests in Vancouver. Buyers in this country (England) have much to be thankful for that the western domestic squabbles enable them to secure some excellent bargains from the Canadian sellers. That the Dominion receives poor value for its exports of softwoods is scarcely open to question. For years past, Douglas fir and hemlock have been sold at uneconomical prices, . . . the results achieved fall far below the figures which ought to be realized. . . ."†

Total water-borne export of 1,192,195,672 F.B.M. of lumber for the year, less than 1 per cent. below the record export of 1936, was a remarkable achievement under existing business conditions. In this field the United Kingdom continues to be the brightest spot with largely increased sales wiping out the slight falling-off of the previous year.

One of the features of the year in the field of export business was the visit to the Province from August 25th to September 3rd of a party of some thirty-two prominent representatives of the trade in England, Scotland, Ireland, and France. This party, conducted by Mr. W. A. McAdam, Acting Agent-General of the Province in England, and accompanied by Mr. J. C. Berto, Lumber Trade Commissioner to the United Kingdom, were shown as much of the logging and milling industries on the Lower Coast as could be well managed in a few days.

This visit, following up a precedent created in the tour of the representatives of the Timber Trade Council of Great Britain in 1936, could hardly fail to have been mutually advantageous.

* McLean's Magazine, January 1st, 1939.

† " Timber and Plywood," December 10th, 1938.

Ocean freight rates, which had constituted such a serious stumbling-block during the preceding twelve months, returned to something near a normal level in 1938, with space correspondingly easy to secure. During 1937 rates to the United Kingdom, Japan, China, and Australia increased more than 100 per cent. In December, 1937, they had dropped back 25 per cent. from their high level and by February, 1938, were close to the low of two years previous.

A growing public interest in raw log export is being evidenced during the past few years. In logging circles the situation in this regard is commonly well understood, but the case is not so clear to those less intimately interested. Briefly stated, Crown grants prior to March 12th, 1906, did not restrict the export of logs. Export of logs from such lands cannot be controlled without modifying the terms of all Crown grants registered prior to that date, which would involve land and stumpage values, and constitute a major issue of public policy. It is from such lands that the major part of log export is made.

It is enacted that " all timber cut on Crown lands, or on lands granted after the twelfth day of March, 1906 " (" Forest Act," sec. 90), shall be manufactured within the Province, except that the Lieutenant-Governor in Council may permit export " upon such terms and conditions as he sees fit." The export of raw logs from these classes of lands has been confined to a legitimate relief avenue for disposal of logs cut for a local market which unforeseen events proved could not absorb them.

All applications in the Vancouver Forest District for the export of such logs are first reviewed by an Export Advisory Committee, on whose advice the Government acts. This Committee is composed of loggers and millmen, representative of the industry and familiar with market conditions. Their advice to the Government has been invaluable.

Breaking down the tables of log exports published annually in this report, it is found that the following quantities have been exported from old Crown grants and under permit from non-export areas:—

RAW LOG EXPORT.

(M. Feet B.M.)

| Year. | Exportable. | Permit Export. | Total Export. |
|---|---|---|---|
| 1929 | 225,731 | 16,586 | 242,317 |
| 1930 | 153,190 | 19,729 | 172,919 |
| 1931 | 182,787 | 37,389 | 220,176 |
| 1932 | 73,342 | 92,423 | 165,765 |
| 1933 | 157,627 | 51,314 | 208,941 |
| 1934 | 142,232 | 30,504 | 172,736 |
| 1935 | 207,138 | 28,153 | 235,292 |
| 1936 | 193,536 | 25,926 | 218,829 |
| 1937 | 254,597 | 15,876 | 270,472 |
| 1938 | 220,462 | 39,211 | 259,673 |
| Totals | 1,810,642 | 357,111 | 2,167,120 |

Total log scale for same period, 25,374,142.
Total log export, 8.5 per cent. of total scale.
Permit export, 16.4 per cent. of total export.
Permit export, 1.4 per cent. of total scale.

Without venturing any comment on the merits of the case for or against control of log export from old Crown grants, it is evident from the foregoing table that permit export must have been reasonably well-confined to legitimate relief under unforeseen and uncontrollable market conditions.

The shingle business and, to a lesser extent, cedar log-sales continue to be dominated by the United States import quota. Export of shingles to the United States for each half year in turn, since 1936, has been limited to 25 per cent. of the American market during the preceding six months. Quotas have been:—

| | SQUARES. | |
|---|---|---|
| | First Half-year. | Second Half-year. |
| 1936 | ..... | 1,419,747 |
| 1937 | 1,048,262 | 892,273 |
| 1938 | 916,246 | 864,881 |

Cedar shingles are gaining favour in overseas markets and we may anticipate an increased overseas trade in the course of time. In the meantime, and for years past, the United States has been the principal outlet for the product of this not inconsiderable branch of the industry.

The prevailing quotas have had a crippling effect in British Columbia, reducing the shingle-mills to part time and, in many cases, unprofitable operation, with very doubtful long-term value to our neighbours across the line. British Columbia edge-grain cedar shingles found a place in that market on merit and it can only be retained on merit. It is at least an even chance that the shingle market closed to British Columbia operators will in large measure be lost to wood altogether in favour of competing roofing materials, a mutual loss to the industry on both sides of the line.

Under the terms of the recent trade agreements the duty-free quota will be changed to 30 per cent. of the average annual United States consumption for the preceding three years. Shipments beyond this quota may have a duty of 25 cents per square levied on them.

The pulp and paper industry, which seemed in early 1937 to have surmounted all its business difficulties and promised to lead the way to final unquestioned recovery, fell again on evil days before the year was out. During 1938 local mills operated on part time or closed down altogether.

These two years have achieved independence of the interlocking contract and a somewhat better price, advantages more than offset for the immediate present by reduced demand.

Many explanations for sharply curtailed buying have been offered, one of which was that surplus stocks of paper were acquired in 1937 in anticipation of the forewarned increase to $50 per ton in 1938. This being the case, the exhaustion of these stocks and a return to normal buying could be reasonably predicted for September or October. Unfortunately, the normal buying failed to materialize and we must look further afield for our reasons.

Minor products, poles, cordwood, railway-ties, mine timbers, and miscellaneous production of ranchers and small camps have, unfortunately, shared in the generally reduced output of the year, and prospects for improvement are not particularly good. Current tie contracts are being let on a reduced scale and the pole market is at a virtual standstill.

## ORGANIZATION AND PERSONNEL.

The permanent staff of the Branch has varied from a minimum of about 110 at the time it was organized in 1912 to a maximum of 253 in 1926 and in 1931. It will be noted that with a continuously employed " temporary " personnel of twenty the staff this year is back to the previous high of 253, an increase from a depression low of 193 in 1935. The reduction in staff subsequent to 1931 eliminated positions no longer necessary by reason of reduced business. The increase since 1935 is accounted for in appointments made essential by increasing business, and are in no way directly related to prior eliminations.

An inevitable transition from a preponderance of large operations to a preponderance of small operations is in progress in the logging field and will couple increased administrative duties with decreased output and revenue. Two timber-sales, two inspections, two scales, and two accounts will develop where one covered all requirements before; and with the cutting-off of licences and Crown-granted lands which, whatever their attendant disadvantages, produced maximum output with minimum supervision and book-keeping, operators may be expected to turn more and more to Crown timber lands.

The effects of this transition are already felt and, coupled with increased responsibility and many new lines of work, what was previously a reasonably adequate staff is no longer able to cope satisfactorily with the load involved. More especially, ranger and technical staffs will have to be increased in the future if the public interest in the forest resource is to be safeguarded and its value enhanced.

No change of any importance was effected in the organization of the Branch during the year, but it is proposed, before another year is past, to combine the existing Research and Surveys Divisions of the Victoria office. These two Divisions, growing as circumstances and necessity dictated—Forest Surveys from unrelated cruises following the war years and Research from a technical forester assigned to growth-studies in 1921—have long since assumed responsibility for various lines of highly essential forest-work, many of which can no longer be clearly defined as belonging to one or the other. It is anticipated that an amalgamation will improve supervision and eliminate certain existing duplication of effort.

## DISTRIBUTION OF FORCE, 1938.

| Forest District. | Permanent. | | | | | | | | | | | | Temporary. | | | | | | Grand Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Chief Forester, Asst. Chief Forester, and Foresters. | District Foresters and Assistant District Foresters. | Supervisors of Scalers and Assistants. | Scalers and Assistant Scalers. | Assistant Foresters and Junior Foresters. | Inspectors, Royalty, Mechanical, and Export. | Supervisors of Rangers and Fire Inspectors. | Rangers. | Draughtsmen. | Clerks, Stenographers, and Messengers. | Miscellaneous. | Total, Permanent Force. | Assistant Rangers. | Patrolmen, Lookoutmen, and Dispatchers. | Launch Crews. | Cruisers, Compassmen, and Packers. | Miscellaneous. | Total, Temporary Force. | |
| Vancouver | ---- | 2 | 1 | 26 | 3 | 1 | 5 | 17 | 2 | 23 | 4 | 84 | 27 | 31 | 9 | ---- | 15 | 82 | 168 |
| | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 2* | ---- | ---- | ---- | 2* | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Prince Rupert | ---- | 2 | ---- | 1 | ---- | ---- | 1 | 8 | ---- | 6 | ---- | 18 | 8 | 9 | 3 | ---- | 1 | 21 | 39 |
| Fort George | ---- | 2 | ---- | ---- | ---- | ---- | ---- | 7 | ---- | 5 | ---- | 14 | 10 | 15 | ---- | ---- | 1 | 26 | 40 |
| Kamloops | ---- | 2 | 1 | ---- | 3 | ---- | 1 | 14 | 1 | 8 | ---- | 30 | 23 | 26 | ---- | ---- | 3 | 52 | 82 |
| Nelson | ---- | 2 | 1 | ---- | 1 | ---- | 3 | 9 | 1 | 8 | ---- | 25 | 26 | 33 | ---- | ---- | 2 | 61 | 86 |
| Victoria | 5 | ---- | ---- | ---- | 18 | 3 | ---- | ---- | 6 | 30 | ---- | 62 | ---- | ---- | ---- | 39 | 3 | 42 | 122 |
| | ---- | ---- | ---- | ---- | 2* | ---- | ---- | ---- | 3* | 3* | 10* | 18* | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Totals | 5 | 10 | 3 | 27 | 25 | 4 | 10 | 55 | 10 | 80 | 4 | 233 | 94 | 114 | 12 | 39 | 25 | 284 | 537 |
| | ---- | ---- | ---- | ---- | 2* | ---- | ---- | 2* | 3* | 3* | 10* | 20* | ---- | ---- | ---- | ---- | ---- | ---- | ---- |

* Permanently employed but not Civil Service appointments and paid from funds other than Salary Vote.

## PERSONNEL AND ENROLMENT.

*Forest Development Projects, October, 1937, to April, 1938, and Youth Forestry Training Plan, May to October, 1938.*

| | Foresters in Charge. | Supervisors. | Clerical. | Foremen and Sub-foremen. | Cooks, 2nd Cooks, and Flunkies. | Time-keepers and Miscellaneous. | Enrollees. | Total. |
|---|---|---|---|---|---|---|---|---|
| Forest Development Projects, October, 1937, to April, 1938 | 3 | 2 | 27 | 65 | 75 | 43 | 4,005 | 4,220 |
| Youth Forestry Training Plan, May to October, 1938 | 2 | 4 | 16 | 40 | 48 | 12 | 690 | 812 |
| Total individuals | 3 | 4 | 27 | 95 | 111 | 43 | 4,695 | 4,976 |

## FOREST DEVELOPMENT PROJECTS, 1937–38.

In October, 1937, the Forest Development Projects were again undertaken on a scale about twice the size of the 1936–37 programme. Provision was again made to employ during the winter months the single homeless men registered on relief in Vancouver on projects undertaken as a direct benefit to forest protection and development.

Again, enrolment of the men for the twenty-five camps was entirely in the hands of the Provincial Relief Office in Vancouver, while the selection and supervision of the projects was undertaken by Forest Service officers. The plan dovetailed nicely with the summer Forest Protection activity, as many Assistant Rangers temporarily employed during the summer assumed supervisory positions with the Forest Development Projects immediately the protection-work terminated. Apart from certain administrative expenditures, the Dominion Government again contributed 50 per cent. towards the cost of the programme.

The experience of the Assistant Rangers in the programme of 1936–37 proved invaluable to them in meeting the increased enrolment in the 1937–38 plan. In a great many cases the camps they had administered the first season were doubled in capacity, which created a corresponding increase in responsibility.

Rates of pay for the enrollees were the same as last year—namely, 30 cents an hour for regular labourers and $30 a month and board for flunkies and bullcooks. Straw-bosses were

paid 35 cents an hour and all hourly men were deducted 75 cents a day for board and lodging. Weekly hours of work were limited to forty-four. The system of deferred pay cheques was abolished and $4 vouchers issued which were negotiable singly at interims of one week at certain post-offices throughout Canada.

The maximum number of enrollees in camp at any one time was 1,906, but owing to the rotation system, 4,005 regularly enrolled men passed through the camps and 205,006 man-days of work were accomplished by these men. The work may be divided into four distinct classes:—

(1.) Park Development, 47.4 per cent. of total man-days.
(2.) Watersheds, 6.4 per cent. of total man-days.
(3.) Provincial Forest Reserves, 19.6 per cent. of total man-days.
(4.) Forest-protection, 26.6 per cent. of total man-days.

Park acres developed included Dean Park, Thetis Lake, Mount Douglas, Englishman River, Little Qualicum, Elk Falls, Capilano Canyon, Stamp Falls, Grouse Mountain, Medicine Bowls, and Cultus Lake. Particular attention was given to the rendering of these areas suitable for the recreationally-minded public.

Watershed development is limited in scope because of the rigid medical restrictions placed on camps and workers in those areas; however, in both the Nanaimo and Seymour Creek watersheds fire-guards were constructed and slash-disposal work carried out.

The Provincial Forest Reserves that could be conveniently improved through the use of this labour received a favourable amount of attention. Green Timbers Forest Experiment Station, Cowichan Lake Forest Experiment Station, Campbell River Ranger Station, and the Sayward Forest provided the material for a variety of types of work; land-clearing, road-building, snag-falling, erection and repair of permanent buildings, and fire-line construction.

The main item in connection with the forest-protection phase was the opening-up of old railroad grades into particularly hazardous areas, making them accessible to truck traffic; and, in conjunction with this, attention was given wherever possible to the elimination of particularly bad snag-hazards.

Although the winter season cannot be recognized as the most suitable time of the year to undertake work of this nature, yet the quality of the work done, particularly with reference to park development, shows that a substantial return is being received for the expenditure involved. Not only is the critical unemployed situation arising in Vancouver each winter relieved, but areas are being improved which were heretofore inaccessible for recreational purposes. With improvement these have become immediately popular. Three years ago half a dozen visitors to the Elk Falls Park would have been a red-letter day; but last summer, even in spite of the unfavourable fire season, no less than 2,000 cars visited the park. With this increase in interest displayed so conspicuously, it is apparent that such an interest can be maintained only through adequate provision to maintain the developments carried out during the past two seasons under the Forest Development Projects.

| | |
|---|---|
| Number of projects | 25 |
| Enrolled at one time (maximum) | 1,906 |
| Total men enrolled | 4,005 |
| Man-days worked (supervisory included) | 230,744 |

## YOUTH FORESTRY TRAINING PLAN, 1938.

A training-ground for British Columbia's unemployed youth was provided for the fourth successive season, but the summer of 1938 marked only the second consecutive summer that this training was put into effect as an integral part of the Dominion-Provincial Youth Training Projects Agreement, financed jointly by the Dominion and Provincial Departments of Labour and supervised by British Columbia Forest Service officers.

Since the inception of the plan in 1935, the applications have increased from 891 in that year to 1,440 in 1938, showing a decided increasing interest in the programme as a training field. Out of the 1,440 applicants, 689 were enrolled in the training course. The Department of Labour was again instrumental in setting standards of enrolment and selecting eligible trainees, who were required to be between the ages of 18 and 25, preferably with some high school education, resident in British Columbia at least since the summer of 1933, and physically fit. Preference was given to applicants whose families were in necessitous circumstances.

Among the 689 enrolled with the Youth Forestry Training Plan, 91 secured employment during the training period; 55 left to return to school, and 40 quit for no specific reason; 9 left because of injury or sickness, and 24 were discharged. The rate of wages remained unchanged from previous programmes and was set at $1.75 per work-day, with a deduction of 75 cents a day being made for board, lodging, and transportation. Ranger Assistants resident at home were paid $45 a month with expenses when away from Headquarters. In a few cases, $55 a month was paid to Ranger Assistants who were forced to board away from home because of a lack of suitable applicants in the vicinity of the Ranger stations. Total expenditure under the plan was $169,762.13.

As the majority of applicants came from the Coast area of the Province, three clearing centres were set up; one at the Green Timbers Forest Experiment Station, one at the University of British Columbia Demonstration Forest, and one at the Cowichan Lake Forest Experiment Station. At these clearing stations successful applicants received their initial training to determine their fitness before being allocated to the various crews throughout the Province. The Aleza Lake Forest Experiment Station also served as a clearing centre for the northern section of British Columbia. At Green Timbers an additional area was cleared and improvements made to permanent buildings. The road into the Cowichan Lake Forest Experiment Station was ditched and gravelled to allow it to hold up under year-round traffic; the foreshore was also cleaned of accumulated debris, a new boat-house float constructed, and clearing of snowbreak undertaken on the North Arm Reserve. Although the University Demonstration Forest only served as a temporary clearing station, the trainees gained valuable experience in forest stand improvement on that area. At Aleza Lake new foundations were built under several of the station buildings and the system of trail communications improved throughout the reserve. All work at the Experiment Stations was supervised by technical forest officers.

Aside from the Experiment Stations, thirty-two separate Forest Development and Protection Projects carrying from six to twenty men were undertaken throughout the whole of British Columbia. By the end of the three and a half months training period these field crews had constructed 105½ miles of new protection-trail and had reconditioned 69½ miles of old trail, built 6¼ miles of new forest-protection road and reconditioned 28 miles of old road, constructed 5 lookout towers, built 40 bridges, strung 14½ miles of telephone-line, placed 150 lineal feet of cribbing, and constructed 21 permanent buildings, ranging from a wood-shed to a 20- by 40-foot log boat-house.

These accomplishments for the most part were of a direct benefit to the Forest Protection Service; but the Provincial Game Board, fish and game clubs, and Irrigation Boards were also able to benefit directly by the work accomplished in connection with the Youth Forestry Training Plan. A limited amount of attention was given to certain recreational projects at King George VI. Park, south of Rossland, the Kokanee Glacier Park, and the Silver Tip Falls Park.

Each of these crews received, in addition to their practical training, lectures on forest topics given by a special instructor, supervisor, Ranger, foreman, or a member of the Headquarters staff. The training and work in the three larger forest districts was again aided by special field supervisors who proved invaluable in correlating the efforts of the training crews with those of the district offices.

The value of Ranger Assistant services to the Rangers was proven beyond a doubt this season. Not only were more Ranger Assistants in demand, but their services during previous summers had been so satisfactory that almost without exception the Rangers requested the same trainees be appointed again this summer. The total number of 115 Ranger Assistants were appointed and the Department of Labour tentatively waived the regulation that no applicant was to be entitled to more than one season's training and allowed more than half this number to take over their Ranger Assistant duties for a second summer.

## THE MULTIPLE USE OF FOREST AREAS.

In the Government report to the Rowell Commission this year it was stated that the total area of the Province was 234,403,000 acres and the tillable area was 4,240,000 acres. This latter constitutes only 2 per cent. of the total area of the Province. It is, therefore, quite obvious that the citizens of British Columbia must largely depend for their economic and social welfare upon the uses to which we put the remaining 98 per cent. of our Province.

The resources of this area may be roughly divided into two classes—" non-renewable " and " renewable." The mines constitute the " non-renewable," and little can be done about them except to avoid waste—each ton of ore removed from the earth means one less ton as an asset of the Province.

The " renewable resources " comprise not only the important timber crop, but the closely associated wild-life crops of fish and game. Dependent upon these is the sport of hunting and fishing and the development of the growing tourist trade is closely related. All forms of recreation, such as camping and ski-ing, are further uses of our vast outdoors. Upon the vision and imagination which we display in the perpetuation and development of these commercial and recreational assets will largely depend the prosperity and welfare of the next generation.

## FOREST SURVEYS.

In the first annual report of the Forest Branch, for the year 1912, the then Chief Forester stated that investigations had " gone far enough to show that British Columbia contains not less than one hundred million acres of forest land, and that the total stand of commercial timber is certainly not less than three hundred billion feet, and probably much more." The report continues to point out that use amounted to about one billion and a quarter feet per year and that " at the present rate of cutting, making no allowance at all for annual growth, it would take nearly 250 years to use up merely the mature timber now standing."

In 1918 the Dominion Commission of Conservation published its comprehensive " Forests of British Columbia " which embodied the best available information of the day and in which timber stands of the Province were estimated, in round figures, to be 350 billion feet.

Forest management was based on these estimates, sufficient for their day, until a conviction gained strength that they left much to be desired and that more accurate data must be secured if major blunders were to be avoided. Out of this conviction grew by gradual development the Forest Surveys Division of the Branch, now charged with the vital responsibility of maintaining an accurate inventory of our resources, the first revised statement of which was published in " The Forest Resources of British Columbia " in 1937.

The inventory constitutes the forester's stock-sheet and is even more essential in forest management than is the stock record in other business endeavour.

Coupled with the inventory a second important function of the Division is the defining of productive forest units as required by statute and the preparation of working plans designed to meet the special features of each such unit. These are the Forest Reserves, or Provincial Forests, which have been progressively reported on herein for some years past.

In developing field and office work incident to these duties, tried and proved methods have been adapted to British Columbia conditions and some important innovations have been originated. The most recent improvements in methods have been the adoption of aerial photography and the Hollerith punch-card system of recording data, both of which are further dealt with elsewhere in this report.

The records of the Division, other than those of a confidential nature, are freely available to the public and increasing use is being made of them each year.

Four new Provincial Forests, the Kingcome, Seymour, Upper Arrow, and Lower Arrow were created during the year. Three of these—the Kingcome, Seymour, and Upper Arrow—have already been reported on. There are now forty-three Forest Reserves; seventeen on the Coast and twenty-six in the Interior, totalling 8,910 and 19,257 square miles respectively, and aggregating 28,167 square miles.

*Lower Arrow Forest.*—The estimates, forest and topographic maps, and preliminary management recommendations were completed for the *Lower Arrow Forest* this year, following the survey in 1936. This Forest is located in the Nelson Forest District and comprises approximately the drainage areas tributary to the northern half of Lower Arrow Lake. It includes some of the best growing sites in the Southern Interior of British Columbia.

In its present condition the Forest could supply a sustained annual yield of 9,800,000 F.B.M. from accessible areas. The output could be increased to 10,800,000 F.B.M. by including the areas considered to be inaccessible at the present time. The annual cut averaged 3,300,000 F.B.M. over the past decade, but when fire losses of mature timber are taken into consideration the average annual depletion totals 5,200,000 F.B.M. The surplus capacity

should aid materially in balancing the overcutting and excessive fire depletion in certain portions of the Southern Interior.

The Forest was found to contain the following:—

| | Acres. | Acres. |
|---|---|---|
| *Productive Forest Land—* | | |
| Mature timber— | | |
| Accessible | 26,920 | |
| Inaccessible | 7,670 | |
| | | 34,590 |
| Immature timber— | | |
| 1–20 years old | 11,110 | |
| 21–40 years old | 20,450 | |
| 41–60 years old | 31,750 | |
| 61–80 years old | 9,460 | |
| 81–100 years old | 11,710 | |
| 101–120 years old | 1,910 | |
| | | 86,390 |
| Not satisfactorily stocked— | | |
| Logged | 80 | |
| Logged and burned | 190 | |
| Burned | 19,800 | |
| Deciduous forest | 19,700 | |
| Non-commercial conifers | 22,920 | |
| | | 62,690 |
| Total sites of productive quality | | 183,670 |
| *Non-productive Areas—* | | |
| Barren, alpine, and scrub | | 290,520 |
| Swamp and water | | 4,930 |
| Alpine grazing and wild hay | | 2,070 |
| Total non-productive sites | | 297,520 |
| Total area of Forest | | 481,190 |

Timber values are estimated as follows (over 11 inches, D.B.H.):—

| Species. | Accessible. | Total. |
|---|---|---|
| | M.B.M. | M.B.M. |
| Engelmann spruce | 50,910 | 85,780 |
| Western red cedar | 46,340 | 50,220 |
| Western hemlock | 42,710 | 48,280 |
| Silver fir (balsam) | 29,830 | 41,260 |
| Douglas fir | 23,630 | 24,010 |
| Western white pine | 14,260 | 14,930 |
| Western larch | 7,250 | 8,490 |
| Western yellow pine | 1,670 | 1,670 |
| Lodgepole pine | 300 | 870 |
| Cottonwood | 90 | 90 |
| Totals | 216,990 | 275,600 |

In addition, there are 185,000 M.B.M. available as thinnings on 43,940 acres of immature timber.

Crown ownership of timber values aggregates 91 and 93 per cent. of the accessible and total volumes respectively.

*E. & N. Railway Grant.*—The forest and topographic maps, estimates, and report have been completed for this area, culminating the survey which was commenced in 1936. The primary objective of the survey was to determine the productive condition of the logged-over

areas, but it was later extended to obtain a detailed inventory of the forest resources on the Grant. The work on this project was greatly facilitated over portions of the area by the use of vertical air photographs supplied by the Royal Canadian Air Force and the Air Survey Section of this Division.

At the time of examination 25.5 per cent. of the areas logged or logged and burned had restocked satisfactorily. Allowing a reasonable period of ten years for natural regeneration to become established, and deducting the areas logged or logged and burned during regeneration period, it was found that 44.4 per cent. of the remainder was satisfactorily stocked.

The following table provides a more complete analysis of the conditions of logged-over lands, E. & N. Land Grant:—

| Classification. | Period. | Condition of Areas, in per Cent. | | | | | Total Area (Acres). |
|---|---|---|---|---|---|---|---|
| | | Satisfactorily stocked. | Unsatisfactorily stocked. | | | | |
| | | | Fair. | Poor. | *Nil.* | Total. | |
| Logged and logged-and-burned areas | Up to December 31st, 1936 | 25.5 | 7.7 | 52.5 | 14.3 | 74.5 | 391,105 |
| | Up to December 31st 1926 | 44.4 | 8.1 | 43.3 | 4.2 | 55.6 | 208,095 |

The forest area of the Grant is summarized briefly as follows:—

*Productive Forest Land—*

| | Acres. | Acres. |
|---|---|---|
| Mature timber— | | |
| Accessible | 665,440 | |
| Inaccessible | 5,140 | |
| | | 670,580 |
| Immature timber | | 227,800 |
| Unsatisfactorily stocked | | 414,910 |
| Total sites of productive quality | | 1,313,290 |
| *Non-productive and Non-forest Land—* | | |
| Scrub, alpine, and rock | | 622,270 |
| Swamp and water | | 61,880 |
| Clearings, cultivated, villages, etc. | | 70,060 |
| Total non-forest sites | | 754,210 |
| Total area | | 2,067,500 |

Land ownership is divided as follows: 2 per cent. vacant Crown land, 48 per cent. E. & N. Railway Company holdings, and 50 per cent. other Crown-grant holdings. Productive forest sites on vacant Crown land involve 4,860 acres of mature timber, 16,460 acres of immature timber, and 16,760 acres of unsatisfactorily stocked areas.

The timber values are estimated as follows (over 11 inches D.B.H.):—

| Species. | Accessible. | Total. |
|---|---|---|
| | M.B.M. | M.B.M. |
| Douglas fir | 12,340,720 | 12,387,150 |
| Western hemlock | 3,123,970 | 3,135,360 |
| Western red cedar | 1,716,910 | 1,723,920 |
| Silver fir (balsam) | 550,800 | 557,530 |
| Western white pine | 156,940 | 158,150 |
| Sitka spruce | 8,520 | 8,520 |
| Yellow cedar (cypress) | 2,780 | 2,780 |
| Totals | 17,900,640 | 17,973,410 |

Of the total volume 73,860 M.B.M., 8,555,660 M.B.M., and 9,343,890 M.B.M., are owned respectively by the Crown, the E. & N. Railway Company, and other Crown-grant holders.

*Moresby Forest.*—This Forest is located in the Prince Rupert Forest District and comprises Moresby Island and adjacent small islands in the Queen Charlotte Islands group.

The preliminary management recommendations and estimates for the proposed *Moresby Forest* have been completed. Forest and topographic maps will be available for distribution in the near future.

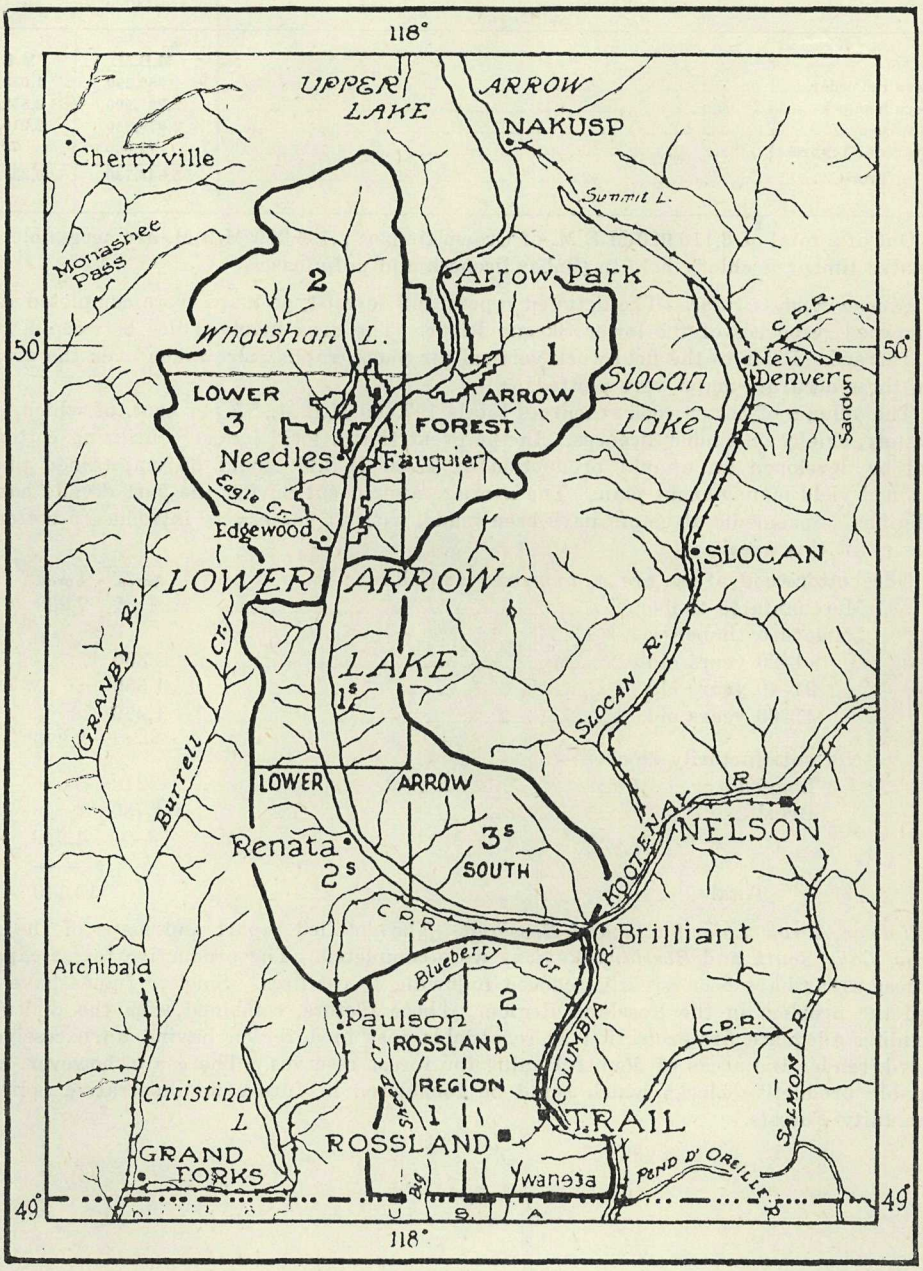
Vertical air photographs, supplied by the Royal Canadian Air Force and the Air Survey Section of this Division were plotted in detail, thus providing an accurate basis for all mapping.

This area is recommended as a Provincial Forest to be managed in conjunction with Graham Island, or the southern portion of Graham Island, as a working circle. Under present conditions the Forest is capable of supplying a sustained annual yield of 100,500 M.B.M. from accessible areas and of a quality acceptable to existing markets. When the inaccessible areas are taken into consideration the output could be increased to 107,000 M.B.M. for continuous production. The Forest is essentially a pulp unit, though high-grade lumber and special products, such as aeroplane stock, are also available. Utilization during the five years prior to the survey averaged 80,000 M.B.M. annually. There are now three logging operations in the Forest, cutting being chiefly in privately owned timber. Their output for 1937 totalled 105,000 M.B.M. Fire losses are negligible.

For the time being improved management practice should be concerned with obtaining natural regeneration on the cut-over areas. The necessity for research-work in this respect, and in other management problems, has been emphasized in the detailed report on this Forest.

The Forest was found to contain the following:—

| | Acres. | Acres. |
|---|---|---|
| *Productive Forest Land—* | | |
| Mature timber— | | |
| Accessible | 218,060 | |
| Inaccessible | 20,100 | |
| | | 238,160 |
| Immature timber— | | |
| 1–10 years old | 1,430 | |
| 11–20 years old | 3,330 | |
| 21–40 years old | 1,260 | |
| 41–60 years old | 1,310 | |
| 61–80 years old | 870 | |
| 81 years and over | 680 | |
| | | 8,880 |
| Not satisfactorily stocked— | | |
| Logged | 14,000 | |
| Deciduous forest | 390 | |
| Non-commercial conifers | 1,210 | |
| | | 15,600 |
| Total sites of productive quality | | 262,640 |
| *Non-productive Areas—* | | |
| Barren, scrub, and alpine | | 575,980 |
| Swamp and water | | 13,270 |
| Total non-productive sites | | 589,250 |
| Total area of Forest | | 851,890 |




# INDEX MAP

*~ Scale-15.78 miles = 1 inch ~*

Timber values are estimated as follows (over 11 inches D.B.H.):—

| Species. | Accessible. | Total. |
|---|---|---|
| | M.B.M. | M.B.M. |
| Western red cedar | 984,290 | 1,085,370 |
| Western hemlock | 2,707,900 | 2,852,780 |
| Sitka spruce | 2,079,880 | 2,219,150 |
| Yellow cedar (cypress) | 71,660 | 78,080 |
| Totals | 5,843,730 | 6,235,380 |

Out of a total of 3,110,920 M.B.M. of Crown timber, 2,795,300 M.B.M. are accessible. The alienated timber is chiefly held in timber licences and pulp leases.

*Skeena River Cruise.*—The detailed report and forest-type maps were completed for the cottonwood resources of the lower Skeena River. The area involved lies between Kwinitsa and Terrace. Prior to the field-work vertical air photographs were taken over the area and from these accurate maps were plotted.

The volume of cottonwood resources totals 197,400 M.B.M., 75 per cent. of which is held privately, chiefly on timber licences. In the event that a local industry utilizing cottonwood could be developed an annual production of 4,700 M.B.M. could be maintained under a sustained yield management plan. The average annual cut during the past decade has been negligible. Spasmodic attempts have been made, without success, to introduce a cottonwood industry in this area.

The cottonwood areas are summarized as follows:—

| | Acres. | Acres. |
|---|---|---|
| Merchantable timber | | 7,930 |
| Immature timber— | | |
| 1–20 years old | 350 | |
| 21–40 years old | 1,550 | |
| 41–60 years old | 1,370 | |
| | | 3,270 |
| Not satisfactorily stocked— | | |
| Logged | 210 | |
| Brush | 1,730 | |
| | | 1,940 |
| Total | | 13,140 |

*Lower Arrow Lake South and Rossland.*—The detailed report and maps of the *Lower Arrow Lake South* and *Rossland Regions* were completed. The productive forest capacities of these areas have been greatly reduced following forest fires. Smelter fumes have intensified the problem in the Rossland Region. These factors, combined with the difficulty of providing adequate fire-protection at reasonable cost in a region having an excessive fire-hazard, render the areas of doubtful value for forest reserves. There are, however, certain valuable productive blocks which could be considered in future administrative policies as community Forests.

The detailed summary of the *Lower Arrow South Region* is as follows:—

*Productive Forest Land—*

| | Acres. | Acres. |
|---|---|---|
| Mature timber— | | |
| Accessible | 9,810 | |
| Inaccessible | 7,710 | |
| | | 17,520 |
| Immature timber— | | |
| 1–20 years old | 13,440 | |
| 21–40 years old | 1,840 | |
| 41–60 years old | 15,830 | |
| 61–80 years old | 4,700 | |
| 81–100 years old | 8,030 | |
| 101–120 years old | 1,790 | |
| Logged selection | 3,490 | |
| | | 49,120 |
| Unsatisfactorily stocked— | | |
| Logged | 2,280 | |
| Logged and burned | 1,590 | |
| Burned | 56,090 | |
| Deciduous | 5,130 | |
| Non-commercial conifers | 12,230 | |
| | | 77,320 |
| Total sites of productive quality | | 143,960 |

*Non-productive and Non-forest Land—*

| | |
|---|---|
| Scrub, alpine, and barren | 192,740 |
| Swamp and water | 300 |
| Alpine pastures, cultivated, etc. | 2,370 |
| Total non-forest sites | 195,410 |
| Total area | 339,370 |

The timber, practically all of which is of Crown ownership, is estimated as follows (over 11 inches D.B.H.):—

| Species. | Accessible. | Total. |
|---|---|---|
| | M.B.M. | M.B.M. |
| Douglas fir | 17,330 | 19,130 |
| Western larch | 8,520 | 10,800 |
| Western yellow pine | 12,540 | 12,540 |
| Western white pine | 3,050 | 9,070 |
| Lodgepole pine | 850 | 2,200 |
| Western red cedar | 7,350 | 11,630 |
| Western hemlock | 2,860 | 8,990 |
| Engelmann spruce | 13,720 | 43,490 |
| Silver fir (balsam) | 1,610 | 7,090 |
| Total | 67,830 | 124,940 |

The detailed summary of the *Rossland Region* is as follows:—

| | Acres. | Acres. |
|---|---|---|
| *Productive Forest Land—* | | |
| Mature timber— | | |
| Accessible | 9,600 | |
| Inaccessible | 1,850 | |
| | | 11,450 |
| Immature timber— | | |
| 1–20 years old | 19,590 | |
| 21–40 years old | 6,320 | |
| 41–60 years old | 21,470 | |
| 61–80 years old | 1,100 | |
| 81–100 years old | 7,990 | |
| 101–120 years old | 2,040 | |
| | | 58,510 |
| Unsatisfactorily stocked— | | |
| Logged | 3,190 | |
| Logged and burned | 7,500 | |
| Burned | 52,130 | |
| Deciduous growth | 5,770 | |
| Non-commercial conifers | 2,990 | |
| | | 71,580 |
| Total sites of productive quality | | 141,540 |
| *Non-productive and Non-forest Land—* | | |
| Scrub, alpine, and barren | | 89,420 |
| Cultivated, cleared, etc. | | 2,660 |
| Swamp and water | | 530 |
| Alpine pastures | | 110 |
| Total non-forest sites | | 92,720 |
| Total area | | 234,260 |

The timber values are estimated as follows (over 11 inches D.B.H.):—

| Species. | Accessible. | Total. |
|---|---|---|
| | M.B.M. | M.B.M. |
| Engelmann spruce | 13,140 | 19,330 |
| Western red cedar | 11,500 | 12,330 |
| Western larch | 9,760 | 11,630 |
| Western hemlock | 10,260 | 10,990 |
| Western white pine | 8,550 | 8,810 |
| Silver fir (balsam) | 3,490 | 4,610 |
| Douglas fir | 2,750 | 2,840 |
| Lodgepole pine | 530 | 610 |
| Totals | 59,980 | 71,150 |

The accessible Crown timber aggregates 45,230 M.B.M. out of a total of 56,400 M.B.M. Alienated timber, all of which is accessible, totals 14,750 M.B.M., 78 per cent. being held under timber licences.

*Current Projects.*—The field survey of the proposed *Graham Forest*, Queen Charlotte Islands, was completed, and maps, estimates, and preliminary management plans are now being prepared. Resurveys of the *Okanagan Forests, Hardwicke, Sonora,* and *East* and *West Thurlow Islands* were undertaken. Maps, estimates, and detailed management recommendations, involving in particular sustained yield production, are now in the course of preparation. It is anticipated that field-work in the Okanagan Valley will be completed

during the 1939 season. It is significant to note that each field project was conducted on areas over which vertical air photographs were made available either through the Royal Canadian Air Force or through the operations of the Air Survey Section of this Division.

*Air Survey Operations.*—The year marked a successful continuation of air survey photographic operations inaugurated by the Forest Branch two years ago. Rounding out the skeleton air survey camera equipment acquired last year, chartering of a faster, more powerful aircraft, more experienced and specialized personnel, and a season characterized by an unusual proportion of bright clear weather, all contributed to a record year for area covered. The quality of photographs and the low cost per square mile of this modern method of obtaining complete, accurate, and detailed information of British Columbia's forest lands were notable. A summary of the season's field activities is as follows:—

| Projects. | Area photographed. | Number of Photographs. |
|---|---|---|
| | Sq. Miles. | |
| Island Forests, Johnstone Straits | 310 | 220 |
| Prince Rupert pulp-wood areas | 2,600 | 3,300 |
| Kemano, Kitlope, Gamsby, and Kimsquit Rivers | 175 | 245 |
| Timber Sale, X5201, Hardwicke Island (special low altitude) | 15 | 100 |
| "Bloedel" fire, Vancouver Island | 225 | 310 |
| Okanagan Watershed | 3,700 | 5,105 |
| Douglas Forest (control strip) | 60 | 45 |
| Total, vertical photography | 7,085 | 9,325 |
| Grazing reconnaissance, Kamloops District (oblique photography) | | 120 |
| Total photographs | | 9,445 |

This work aggregated 119 hours and 39 minutes flying-time with a chartered aircraft especially fitted to accommodate the Forest Branch camera and accessories. An additional 3½ hours were used up on non-photographic reconnaissance flights for party chiefs and Rangers working in the districts flown.

In addition to these field operations, the Air Survey Section completed the plotting of air photographs over Moresby Island, Graham Island, the E. & N. Land Grant, the Bloedel fire, and the Island Forests. Compilation of the current photographic projects are in process. Improvements and additions to office equipment for plotting air photos have been made. After four years of development, a Forest Service stereoscope has been perfected and produced at low cost. These instruments have been supplied, upon special request, to several private and public agencies in the Province and one to the Surveyor-General of British Honduras. An efficient and highly specialized personnel, whose value to the service increases steadily, is gradually being developed.

A growing demand for air photographs from the Forest Branch negatives has been experienced. These have been supplied at cost, as follows:—

| Source of Demand. | Number of Photographs supplied. | | |
|---|---|---|---|
| | Verticals. | Scenic Obliques. | Total. |
| Other Forest Branch Departments (seven items) | 307 | 157 | 464 |
| Other Government Departments (five items) | 311 | 8 | 319 |
| The Logging Industry (four items) | 552 | ..... | 552 |
| Others (twelve items) | 422 | 79 | 501 |
| Totals (twenty-eight items) | 1,592 | 244 | 1,836 |

Requests for advice and information on the application of air photos to various activities continue to be dealt with by correspondence and consultation.

*Lookout Photography.*—A technique has been developed for taking panoramic photographs and for organizing these photographs for effective use on lookout stations as a medium for locating and reporting forest fires. Work in this connection has so far been confined to

the Vancouver, Kamloops, and Nelson Forest Districts. A more complete report on this project is provided under Forest Protection.

*Forest Resources Inventory.*—The Hollerith punch-card system for recording and sorting details of forest estimates was introduced into the forest resources inventory this year. A detailed code permits the recording of miscellaneous data, provided by the forest atlas, which can be readily summarized mechanically. The new system of keeping forest resources records is proving to be efficient and will provide the means for obtaining greater detail in analyzing forest statistics than has heretofore been practical. The electrical equipment necessary to carry out this work has been made available through the co-operation of the Bureau of Economics and Statistics, Department of Trade and Industries.

The Vancouver Forest District atlas and inventory is being revised and the statistical data summarized on punch-cards, 125 watersheds having been completed out of a total of 183. Upon completing the Vancouver District it is proposed to continue this system of tabulation for the Prince Rupert Forest District.

Reconnaissance-work and assistance to Forest Rangers in forest-cover mapping were confined to nine ranger districts, three in the Vancouver and six in the Nelson Forest Districts. This work involved, primarily, a general revision of major forest-type boundaries, classifying immature timber by age-classes, and defining commercial deciduous stands from non-commercial forests.

Field reconnaissance was hampered to a certain extent by smoke from forest fires. An examination and brief report of the White and Lussier River watersheds, covering 400 square miles, was completed. The forest-growth on this area is principally immature timber of older age-classes approaching commercial sizes suitable for minor products. The mature timber present is not considered accessible at the present time. The recreational value of these watersheds is emphasized in the report, exceptional scenic attractions being available.

## RESEARCH.

For some years it has been necessary to restrict activities in the Research Division to the maintenance of the more important studies already in progress. Somewhat more generous provision for this work this year, however, permitted a start on the study of outstanding problems which have been demanding attention for some time. This applies particularly to soil classification in connection with silvicultural investigations which have been long in hand.

### Growth and Yield.

A two-man field crew carried out the periodic remeasurement of thirty-one permanent plots, established to study the growth and mortality of both uncut and cut-over spruce-balsam stands in the Northern Interior. An additional party of three men spent two months gathering information on the growth of red alder.

During the course of the alder study, data were collected on fifty-five temporary yield plots, and stem analyses were made on 115 felled trees. These measurements, together with the information previously gathered from a series of permanent plots, form the basis for volume and yield tables for the species. The volume tables are presented herewith:—

## VOLUME TABLE FOR RED ALDER (*Alnus rubra*).

*Volume in Board-feet based on 8-foot Logs to a Top Diameter of 8 Inches.*
*Stump-height, 1 Foot.*

| D.B.H. (Inches.) | TOTAL HEIGHT IN FEET. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 60. | 65. | 70. | 75. | 80. | 85. | 90. | 95. | 100. | 105. | 110. |
| 8 | 12 | 15 | 17 | 20 | 23 | 25 | 28 | 31 | 34 | ..... | ..... |
| 9 | 36 | 39 | 42 | 45 | 48 | 51 | 54 | 57 | 60 | ..... | ..... |
| 10 | 59 | 65 | 70 | 75 | 81 | 86 | 91 | 97 | 102 | ..... | ..... |
| 11 | 83 | 91 | 99 | 107 | 115 | 124 | 132 | 140 | 148 | 157 | ..... |
| 12 | 105 | 117 | 126 | 136 | 146 | 157 | 167 | 178 | 188 | 199 | 210 |
| 13 | ..... | 139 | 153 | 168 | 183 | 198 | 212 | 227 | 242 | 257 | 272 |
| 14 | ..... | 168 | 184 | 200 | 216 | 232 | 248 | 264 | 280 | 296 | 312 |
| 15 | ..... | ..... | 223 | 241 | 259 | 276 | 292 | 312 | 330 | 348 | 367 |
| 16 | ..... | ..... | 261 | 280 | 300 | 319 | 338 | 358 | 377 | 397 | 416 |
| 17 | ..... | ..... | 290 | 313 | 336 | 359 | 382 | 406 | 429 | 453 | 477 |
| 18 | ..... | ..... | 335 | 360 | 385 | 410 | 435 | 460 | 485 | 510 | 535 |
| 19 | ..... | ..... | 372 | 402 | 430 | 460 | 490 | 518 | 548 | 576 | 606 |
| 20 | ..... | ..... | ..... | ..... | ..... | ..... | 550 | ..... | ..... | ..... | ..... |

Data collected Fraser Valley and Squamish, 1938.
Basis: 110 trees.
Aggregate deviation=0.09 per cent. low.
Average deviation=±9.0 per cent.
Frustum form factor method used.

## VOLUME TABLE FOR RED ALDER (*Alnus rubra*).

*Volume in Cubic Feet based on 8-foot Logs to a Top Diameter of 4 Inches.*
*Contents inside Bark, excluding 1-foot Stump.*

| D.B.H. (Inches.) | TOTAL HEIGHT IN FEET. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 60. | 65. | 70. | 75. | 80. | 85. | 90. | 95. | 100. | 105. | 110. |
| 8 | 8.5 | 9.6 | 10.2 | 11.0 | 11.8 | 12.5 | 13.1 | 14.0 | ..... | ..... | ..... |
| 9 | 10.7 | 12.0 | 13.1 | 13.9 | 14.7 | 16.0 | 16.9 | 17.8 | 18.5 | ..... | ..... |
| 10 | 13.2 | 14.6 | 16.0 | 17.4 | 18.6 | 19.5 | 20.2 | 21.5 | 23.0 | ..... | ..... |
| 11 | 16.0 | 17.8 | 19.2 | 20.2 | 22.0 | 23.3 | 24.8 | 26.0 | 27.1 | ..... | ..... |
| 12 | 19.0 | 20.9 | 23.0 | 24.6 | 26.1 | 28.0 | 29.2 | 30.8 | 32.2 | 33.1 | ..... |
| 13 | 22.5 | 25.0 | 27.0 | 29.0 | 31.5 | 32.6 | 34.0 | 36.0 | 38.0 | 39.5 | ..... |
| 14 | 25.8 | 28.8 | 31.0 | 33.0 | 35.2 | 37.8 | 40.0 | 42.2 | 44.0 | 46.0 | ..... |
| 15 | 30.0 | 32.7 | 35.3 | 38.2 | 41.0 | 43.8 | 45.3 | 47.5 | 50.2 | 52.8 | ..... |
| 16 | ..... | 38.0 | 42.0 | 44.1 | 47.5 | 50.0 | 52.2 | 55.5 | 58.4 | 60.5 | 63.2 |
| 17 | ..... | 43.0 | 46.5 | 50.0 | 53.6 | 56.4 | 59.0 | 62.7 | 66.0 | 68.3 | 70.5 |
| 18 | ..... | ..... | 52.4 | 55.5 | 59.5 | 63.2 | 66.0 | 70.0 | 73.6 | 76.0 | 77.5 |
| 19 | ..... | ..... | 57.0 | 61.2 | 66.0 | 69.7 | 72.8 | 76.5 | 80.0 | 82.8 | 86.0 |
| 20 | ..... | ..... | 63.5 | 67.8 | 72.2 | 76.0 | 79.0 | 84.0 | 88.2 | 92.0 | 95.0 |
| 21 | ..... | ..... | 68.6 | 74.2 | 77.5 | 82.1 | 86.0 | 91.0 | 96.0 | 99.0 | 103.0 |
| 22 | ..... | ..... | 75.0 | 79.0 | 84.0 | 88.0 | 92.0 | 98.0 | 104.0 | 108.0 | 112.0 |

Data collected Fraser Valley and Squamish, 1938.
Basis: 117 trees.
Aggregate deviation=+0.8 per cent.
Average deviation=±4.4 per cent.
Alinement chart method used (2).

## REFORESTATION.

(*a.*) *Nursery Technique.*—The first Forest Branch nursery was located on Shelbourne Street, Victoria, and it was there in 1928 that the initial seed-beds were sown. Ten years have now passed, and with their passing it is interesting to note some of the changes in nursery technique which have been inaugurated with a view to producing sturdy planting stock at a low cost. Where the first seed-beds were 4 by 12 feet and shaded by rigid shade frames in 6-foot sections, the beds are now 4 by 50 feet and shaded by snow-fencing which can be rolled up in one bundle, thus greatly facilitating the operation of covering and uncovering the beds during the early life of the seedlings. The cost of weeding young seedlings, a tedious and expensive task, has been substantially reduced by the use of a high-pressure torch whose extremely hot flame on being quickly passed over the surface of the soil kills the first crop of annual weeds without injuring the young shoots which are almost ready to push through the ground. Another costly operation is that of lifting, root-pruning, and transplanting one-year seedlings and, to avoid this expense, many North America forest nurseries root-prune the stock as it stands in the bed by means of a stationary blade drawn through the soil about 4 inches below the surface. At Green Timbers there has been developed a root-pruner which is unique in that it features an oscillating blade. Pruning with this machine results in the trees having essentially the same root system as is obtained by transplanting, and at the same time effects quite a reduction in the cost of production. By substituting for the oscillating blade a stationary one set at a slight angle to the horizontal, the pruner is used for lifting, thereby obviating the laborious task of using a spade for getting the trees out of the ground preparatory to shipment to a planting-site.

(*b.*) *Planting and Nursery Development.*—Planting operations were conducted at Great Central Lake, Sayward Forest, Elk Falls Park, and Green Timbers, with an aggregate of 150,325 trees being planted on 161.4 acres. This brings the total to date for number of trees and acres planted to 1,003,400 and 1,322 respectively.

On August 9th the Hon. the Minister announced that as soon as the necessary facilities could be established it would be the policy of the Department to plant up to 10,000 acres of cut-over land per year on Vancouver Island and the Lower Mainland. Our experience has been that a spacing of 6 by 6 feet will produce satisfactorily stocked plantations, and that it requires about 1,000 trees per acre when this interval is used. Therefore the programme will necessitate an annual production of about 10,000,000 trees. With this in view it is planned to increase the capacity of the Green Timbers nursery to 6,000,000 per year and to establish immediately a nursery on the Quinsam River, about 1 mile east of the village of Campbellton, Vancouver Island, to produce the remaining 4,000,000. Forest Development crews are now clearing an additional 4 acres of land at Green Timbers, and are preparing the Quinsam Nursery for sowing to cover-crop next spring. Should no unforeseen delays occur, it is anticipated that the goal of an annual production of 10,000,000 trees will be reached in 1942.

(*c.*) *Seed Collections.*—The current crop of cones on Douglas fir, western hemlock, and western red cedar was better than average over the south-eastern portion of Vancouver Island and in the Lower Fraser Valley. In the Interior portions of the Province the crop of Douglas fir and white spruce cones was poor, while on the Queen Charlotte Islands the Sitka spruce crop was very poor to *nil.*

In planning a large sustained programme of planting, one point to be kept in mind is the periodicity of seed-crops and the necessity of always keeping in reserve at least one year's seed requirements. Our cone collections this year were the largest we have ever made, and will yield sufficient seed to maintain the increased nursery production programme for two years. The details of the collections are as follows:—

| Species. | No. of Bushels of Cones collected. | No. of Cones per Bushel. | Yield of Seed per Bushel of Cones. | Quantity of Clean Seed. |
|---|---|---|---|---|
| | | | Lb. | Lb. |
| Douglas fir | 4,207 | 900 to 1,600 | 0.45 | 1,893 |
| Hemlock | 10 | ..... | 1.00 | 10 |
| Red cedar | ..... | 61,800 | ..... | 15 |
| Lowland fir | 48 | ..... | 1.00 | 48 |
| Total | 4,265 | ..... | ..... | 1,966 |

(*d.*) *Pathology.*—The tree diseases which occur in areas of abundant natural regeneration and kill a large number of young plants may have little or no effect on the final stand, since a high proportion of the trees must necessarily die as the age of the stand increases. On the other hand, these same diseases may have a much more serious effect on the final stand in plantations and, in addition, the damage to seedlings in a nursery may be extensive.

During the past summer, Dr. M. L. Wilson, of Edinburgh University, an expert on Douglas-fir diseases, spent several weeks inspecting the Green Timbers Nursery and the plantations at that point and at Campbell River. In his report Dr. Wilson states that "no serious and widespread fungal diseases were found," although evidence was found of die-back and canker on Douglas fir, honey fungus attacking small groups of Douglas fir, and black leaf-spot on western red cedar. Only a very few trees have been killed in any case. No fungal disease was found among the seedlings in the nursery, nor was any found on Sitka spruce, yellow pine, Scot's pine, and hemlock, in the plantations.

*Silvicultural Studies.*—Current re-examinations were carried out on ten plots already established to study the rate of natural regeneration on cut-over land, seed-tree survival, seedling survival, seasonal height-growth in young stands, root-rot disease in young Douglas-fir stands, and the practicality of artificial regeneration by means of seed-spotting.

The factors upon which forest-management practice is based includes an intimate knowledge of the phenomena of seed-production, seed-dissemination, the survival of disseminated seed, germination, and, finally, seedling survival. As regards Douglas fir, our own work, together with that of the Pacific Northwest Forest Experiment Station, at Portland, has done much to point the way toward perfecting a management technique; however, many phases need elucidating. With this in mind, two new studies were undertaken to further investigate the fruiting habits of Douglas fir and the effect on reproduction of broadcast burning clear-cut areas in the Douglas-fir region.

The fruiting habits of forest trees are, on the whole, very imperfectly known, mainly due to the technical difficulties involved in making such studies. For some years there has been under way at Cowichan Lake a study whose objective is to develop a method of estimating the size, quality, and periodicity of cone-crops for our principal commercial species in stands or on scattered trees left after logging. Supplementing and expanding this study is the one undertaken this year, whereby groups of trees have been placed under observation in nine fully-stocked stands of varying ages and on three cut-over areas where seed-trees have been left. It is anticipated that the results will relate size of cone-crops to the age-class of stands or scattered seed-trees, to the crown class of trees, to the quantity of seed released per unit area, and, possibly, to factors of site and climate. The quality of the seed produced will be determined on the basis of germination tests of samples caught in seed-traps. As the data from these studies are compiled, the results will be of value in estimating the collection of seed for artificial reforestation, in quantities for one or more year's requirements, and also as a basis for the development of silvicultural systems of natural regeneration.

The problem of securing natural regeneration on cut-over land has been attacked from many angles, and numerous theories have been brought forward in explanation. Some of the theories appear to be contrary to casual observation, but one must always bear in mind that there is no universal rule applicable to every set of conditions, and due consideration must be given to the changing combinations of factors which occur between one locality and another. The problem of the effect of slash-burning on natural reproduction is an example of this conflict of opinion, and we find that one school of thought favours burning as a means of promoting regeneration while a second group is equally convinced that burning is a detriment. In both cases factual proof is brought forward, but in nearly every instance an analysis reveals that the areas under comparison are not homogenous with respect to either slope, aspect, soil conditions, vegetative cover, or seed-supply, and areal differences between any one of these factors tend to invalidate conclusions one might draw. Thus, during the past summer, with a view to furthering the knowledge on the comparative effects of logging with burning, and clear-cutting without slash-burning, careful selection was made of a homogenous site in the Alberni District. Following logging, half the area was slash-burned and the remainder left unburned. Study of this area will yield valuable information concerning the effect which broadcast burning of slash has on natural regeneration; soil-texture, structure,

and composition; and the character of the vegetation. However, most of our broadcast burning is done because of the necessity of reducing the fire-hazard.

*Soils.*—The nature of the soil and parent material determines not only the kind but, to a great extent, the distribution of vegetation. Water and nutrients for the tree are provided by the soil, so that there is scarcely a physiological process which is not controlled by it nor a silvical characteristic not dependent upon it. Rate of growth, yield, longevity, form, quality of wood, tolerance, and rate of reproduction are all influenced and may be modified in one way or another by the soil.

Soil-studies are therefore an integral part of a programme of silvicultural research, and a soil survey is basic to the initiation of such work. During the past summer Dr. D. G. Laird, of the University of British Columbia, conducted an intensive survey of the Cowichan Lake Experimental Forest. Analyses were made of the principal soil-types and a map was drawn to show the boundaries of the types as determined by texture.

It was found that, in general, the most favourable soil for forest-growth in the area under examination was a deep one of more than 40 inches to the " C " horizon, having a humic layer, at least reasonably thick, underlaid by a red gravelly sandy loam to a depth of 18 inches or thereabouts and lying upon a brown horizon to " C." Such soils, including a brown type, appear to be more adequately provided with moisture than the fawns.

*Co-operation.*—An amendment to the United States Revenue Act, effective July 1st, 1938, gave white spruce (*Picea canadensis*) lumber a substantial tariff preference over the same product cut from Engelmann spruce (*Picea Engelmanni*). Naturally this differential was of vital concern to the operators along the Canadian National Railway between Prince George and McBride, and it was essential that they have accurate information regarding the proportion of the stands occupied by white spruce. The Northern Interior Lumbermen's Association therefore requested the Forest Branch to co-operate with them in conducting an intensive dendrological study to secure this data.

Six areas were examined between Giscome and Urling. A total of 975.5 chains of strip were run in five areas and 295 acres were sampled at random. In all, 2,189 trees were examined, of which 2,167 were identified as *Picea canadenis* and 22 as *Picea Engelmanni.*

The conclusions arrived at were as follows:—

(*a.*) Both white and Engelmann spruce occur in the forests of the Upper Fraser River Valley.

(*b.*) Of these two species, the white spruce vastly preponderates.

(*c.*) Because of the strong numerical preponderance of white spruce in the forests of the Upper Fraser Valley, the stands may be considered as a pure white spruce-balsam forest-type, and the designation of locally-produced spruce lumber as " white spruce " is justified and well within the limits of reason.

*Improvements.*—The location of forest-development crews at the experiment stations has further enhanced their value through the maintenance of existing roads and trails, the construction of new trails, replacement of a boat-house float, cleaning up of foreshore, and stand-improvement work. In addition, these crews constructed 275 seed-traps for use in research studies, collected 80 bushels of cones, repainted two buildings, and completed numerous small jobs of miscellaneous improvements.

## FOREST BRANCH LIBRARY.

| | 1936. | 1937. | 1938. | Totals. |
|---|---|---|---|---|
| Bound volumes | 149 | 19 | 118 | 286 |
| Government Reports and Bulletins | 1,703 | 301 | 405 | 2,409 |
| Pamphlets | 426 | 75 | 87 | 588 |
| Total | ------- | ------- | ------- | 3,283 |
| Periodicals and Trade Journals | 54 | 54 | 54 | 54 |
| References indexed | ------- | 12,000 | 3,277 | 15,227 |

## WATER-BORNE LUMBER TRADE (IN M.B.M.).

| Destination. | 1929. | 1930. | 1931. | 1932. | 1933. | 1934. | 1935. | 1936. | 1937. | 1938. | Ten-yr. Ave., 1929–38. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Australia | 41,493 | 33,076 | 50,803 | 125,551 | 123,733 | 128,141 | 129,492 | 125,448 | 158,400 | 141,465 | 105,760 |
| New Zealand | 8,559 | 6,416 | 2,579 | 979 | 1,300 | 2,957 | 3,793 | 6,072 | 5,415 | 7,805 | 4,588 |
| South America | 2,449 | 1,775 | 1,354 | 141 | 3,642 | 1,620 | 4,017 | 6,328 | 10,632 | 9,946 | 4,190 |
| China | 43,323 | 55,224 | 53,854 | 53,342 | 130,596 | 108,128 | 91,232 | 102,743 | 47,635 | 43,457 | 72,953 |
| Japan | 192,412 | 150,870 | 138,852 | 60,032 | 60,657 | 80,279 | 43,080 | 33,123 | 30,677 | 9,194 | 79,918 |
| United Kingdom and Continent | 69,904 | 98,038 | 81,356 | 108,315 | 271,073 | 455,695 | 455,862 | 666,272 | 648,364 | 741,631 | 359,651 |
| South Africa | 15,889 | 17,686 | 13,120 | 5,665 | 18,213 | 25,276 | 28,350 | 61,133 | 49,015 | 41,614 | 27,596 |
| India and Straits Settlements | 244 | 241 | 370 | 544 | 917 | 431 | 3,415 | 1,897 | 2,781 | 1,174 | 1,201 |
| United States and Atlantic Coast | 351,527 | 259,094 | 207,586 | 79,683 | 29,528 | 28,735 | 62,013 | 159,904 | 107,933 | 154,038 | 144,004 |
| Philippine and Hawaiian Islands | ..... | 123 | ..... | ..... | ..... | ..... | ..... | 136 | 743 | 1,780 | 278 |
| West Indies and Cuba | 14,347 | 12,781 | 7,521 | 8,240 | 11,830 | 13,467 | 7,133 | 9,823 | 9,487 | 13,584 | 10,821 |
| South Sea Islands | 5,509 | 3,231 | 2,527 | 2,009 | 2,477 | 4,475 | 4,556 | 10,129 | 12,904 | 5,745 | 5,356 |
| Mexico and Central America | 624 | 550 | 479 | 1,746 | 1,669 | 2,410 | 4,870 | 2,821 | 3,748 | 2,271 | 2,119 |
| Egypt | 4,744 | ..... | 4,195 | ..... | ..... | 4,348 | 4,216 | 8,040 | 8,279 | 5,315 | 3,914 |
| *Belgium | ..... | ..... | 336 | 79 | 6,141 | 2,997 | 6,265 | 5,691 | 4,578 | 5,468 | 3,155 |
| *Denmark | ..... | ..... | 62 | ..... | ..... | 5 | 2 | ..... | 29 | ..... | 10 |
| *France | ..... | ..... | 242 | 149 | 10 | 48 | 425 | 724 | 875 | 653 | 313 |
| *Germany | ..... | ..... | 154 | 120 | 127 | 105 | 846 | 746 | 2,836 | 3,383 | 832 |
| *Holland | ..... | ..... | 419 | 144 | 302 | 9 | 1,870 | 1,212 | 1,669 | 3,332 | 896 |
| *Italy | ..... | ..... | 302 | 129 | 351 | 330 | 1,869 | 335 | 1,023 | 73 | 441 |
| *Norway and Sweden | ..... | ..... | 18 | ..... | ..... | 5 | 8 | 24 | 113 | 41 | 21 |
| Spain | ..... | ..... | ..... | 16 | ..... | ..... | 457 | 64 | ..... | ..... | 54 |
| Foreign, unclassified | 50,494 | 73,195 | ..... | 6 | 34 | 4 | 208 | 329 | 241 | 226 | 12,474 |
| Totals | 801,518 | 712,300 | 566,129 | 446,890 | 662,600 | 859,465 | 853,979 | 1,202,994 | 1,107,377 | 1,192,195 | 840,545 |

* Previously included with United Kingdom.

## THE FOREST INDUSTRIES.

### Estimated Value of Production, including Loading and Freight within the Province.

| Product. | 1932. | 1933. | 1934. | 1935. | 1936. | 1937. | 1938. | Ten-year Average, 1929–38. |
|---|---|---|---|---|---|---|---|---|
| Lumber | $13,349,000 | $15,457,000 | $20,377,000 | $24,094,000 | $36,160,000 | $40,638,000 | $36,296,000 | $28,602,200 |
| Pulp and paper | 11,156,000 | 10,852,000 | 12,373,000 | 12,414,000 | 14,950,000 | 17,214,000 | 11,066,000 | 13,445,300 |
| Shingles | 2,805,000 | 4,500,000 | 4,375,000 | 8,750,000 | 7,800,000 | 6,875,000 | 6,875,000 | 5,716,200 |
| Boxes | 1,100,000 | 1,313,000 | 1,632,000 | 1,720,000 | 1,629,000 | 2,122,000 | 1,964,000 | 1,751,900 |
| Doors | ..... | ..... | ..... | 1,693,000 | 2,718,000 | 2,971,000 | 1,353,000 | 873,500 |
| Piles, poles, and mine-props | 772,000 | 450,000 | 487,000 | 810,000 | 1,434,000 | 2,346,000 | 1,615,000 | 2,059,300 |
| Cordwood, fence-posts, and lagging | 1,576,000 | 1,850,000 | 1,335,000 | 1,453,000 | 1,489,000 | 1,459,000 | 1,455,000 | 1,535,200 |
| Ties, railway | 502,000 | 250,000 | 485,000 | 764,000 | 623,000 | 560,000 | 560,000 | 815,700 |
| Additional value contributed by the wood-using industry | 1,014,000 | 1,200,000 | 1,320,000 | 1,300,000 | 1,350,000 | 1,500,000 | 1,400,000 | 1,492,100 |
| Laths and other miscellaneous products | 1,125,000 | 1,000,000 | 1,100,000 | 1,100,000 | 1,200,000 | 1,400,000 | 1,300,000 | 1,362,500 |
| Logs exported | 1,730,000 | 2,228,000 | 1,931,000 | 2,820,000 | 2,646,000 | 3,782,000 | 3,238,000 | 2,736,100 |
| Pulp-wood exported | 28,000 | 55,000 | 46,000 | 23,000 | 11,000 | 5,000 | ..... | 30,300 |
| Totals | $35,157,000 | $39,155,000 | $45,461,000 | $56,941,000 | $72,010,000 | $80,872,000 | $67,122,000 | $60,420,300 |

### Paper (in Tons).

| Product. | 1932. | 1933. | 1934. | 1935. | 1936. | 1937. | 1938. | Ten-year Average, 1929–38. |
|---|---|---|---|---|---|---|---|---|
| Newsprint | 205,050 | 237,107 | 267,406 | 262,123 | 276,710 | 264,136 | 179,639 | 233,567 |
| Other papers | 24,051 | 23,492 | 26,777 | 33,287 | 41,443 | 53,026 | 39,348 | 29,907 |

In addition to 203,610 tons of pulp manufactured into paper in the Province, 45,000 tons were shipped out of the Province during the year.

### Total Amount of Timber scaled in British Columbia during the Years 1937–38 (in F.B.M.).

| Forest District. | 1937. | 1938. | Loss. |
|---|---|---|---|
| Vancouver | 2,693,167,199 | 2,304,440,326 | 388,726,873 |
| Prince Rupert | 157,637,888 | 112,341,760 | 45,296,128 |
| Totals, Coast | 2,850,805,087 | 2,416,782,086 | 434,023,001 |
| Prince Rupert | 21,391,790 | 18,603,310 | 2,788,480 |
| Fort George | 66,058,332 | 64,608,831 | 1,449,501 |
| Kamloops | 147,820,267 | 137,319,569 | 10,500,698 |
| Nelson | 155,840,164 | 141,720,202 | 14,119,962 |
| Totals, Interior | 391,110,553 | 362,251,912 | 28,858,641 |
| Grand totals | 3,241,915,640 | 2,779,033,998 | 462,881,642 |

## SPECIES CUT (IN F.B.M.).

| Forest District. | Fir. | Cedar. | Spruce. | Hemlock. | Balsam. | Yellow Pine. | White Pine. | Lodgepole Pine. | Larch. | Cotton-wood. | Miscel-laneous. | Totals. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vancouver | 1,347,850,333 | 468,985,499 | 22,905,420 | 376,674,298 | 54,140,077 | ..... | 20,528,378 | ..... | ..... | 1,252,596 | 12,103,725 | 2,304,440,326 |
| Prince Rupert | 136,842 | 21,126,125 | 56,219,556 | 26,147,790 | 7,861,610 | ..... | ..... | ..... | ..... | ..... | 849,837 | 112,341,760 |
| Totals, Coast | 1,347,987,175 | 490,111,624 | 79,124,976 | 402,822,088 | 62,001,687 | ..... | 20,528,378 | ..... | ..... | 1,252,596 | 12,953,562 | 2,416,782,086 |
| Prince Rupert | 436,971 | 4,157,515 | 949,945 | 974,072 | 8,415 | ..... | ..... | 10,120,632 | ..... | ..... | 1,955,760 | 18,603,310 |
| Fort George | 7,371,546 | 1,343,603 | 41,193,864 | 46,584 | 142,678 | ..... | ..... | 8,503,902 | ..... | ..... | 6,002,985 | 64,608,831 |
| Kamloops | 60,907,714 | 23,130,093 | 3,946,588 | 88,946 | 8,583 | 32,561,057 | 3,792,467 | 226,116 | 1,040,803 | 275,248 | 11,341,954 | 137,319,569 |
| Nelson | 25,703,262 | 13,015,596 | 21,716,827 | 4,642,371 | 312,084 | 14,067,723 | 8,517,515 | 2,775,665 | 40,042,151 | 1,609,545 | 9,317,463 | 141,720,202 |
| Totals, Interior | 94,419,493 | 41,646,807 | 67,807,224 | 5,751,973 | 471,760 | 46,628,780 | 12,309,982 | 21,626,315 | 41,082,954 | 1,884,793 | 28,618,162 | 362,251,912 |
| Grand totals, 1938 | 1,442,406,668 | 531,758,431 | 146,932,200 | 408,574,061 | 62,473,447 | 46,628,780 | 32,838,360 | 21,626,315 | 41,082,954 | 3,137,389 | 41,571,724 | 2,779,033,998 |
| Grand totals, 1937 | 1,617,748,996 | 582,137,757 | 179,887,207 | 575,562,653 | 93,900,797 | 43,767,890 | 35,361,947 | 23,805,051 | 40,960,357 | 3,834,511 | 44,948,474 | 3,241,915,640 |
| Grand totals, 1936 | 1,590,145,329 | 551,348,174 | 149,037,950 | 464,588,680 | 79,960,739 | 36,836,428 | 24,789,625 | 27,109,138 | 40,942,920 | 5,453,226 | 50,560,985 | 3,020,773,194 |
| Grand totals, 1935 | 1,339,026,242 | 477,362,816 | 125,060,677 | 428,684,859 | 88,647,694 | 33,216,860 | 27,982,161 | 34,775,415 | 46,798,137 | 3,008,870 | 44,724,664 | 2,649,288,395 |
| Grand totals, 1934 | 1,161,212,111 | 335,779,926 | 132,327,306 | 342,766,236 | 77,442,211 | 39,573,745 | 17,136,556 | 19,475,917 | 30,222,468 | 4,052,857 | 54,802,536 | 2,214,791,869 |
| Grand totals, 1933 | 873,187,188 | 374,247,934 | 86,715,876 | 238,472,893 | 68,203,263 | 22,005,856 | 22,186,768 | 7,157,309 | 31,094,619 | 4,468,131 | 170,841,227 | 1,898,581,064 |
| Grand totals, 1932 | 752,558,169 | 319,086,978 | 106,361,793 | 245,169,186 | 54,282,274 | 13,367,227 | 17,992,369 | 7,471,122 | 21,470,125 | 2,941,992 | 70,757,226 | 1,611,458,461 |
| Grand totals, 1931 | 997,513,398 | 356,478,825 | 123,056,421 | 267,283,560 | 45,153,077 | 26,109,228 | 27,006,894 | 38,555,460 | 17,700,108 | 4,029,782 | 45,517,520 | 1,948,404,273 |
| Grand totals, 1930 | 1,319,093,565 | 570,071,915 | 185,696,765 | 329,447,130 | 65,513,782 | 30,463,015 | 28,029,526 | 55,368,482 | 20,585,633 | 2,912,598 | 56,569,927 | 2,663,752,338 |
| Ten-year average, 1929–38 | 1,275,341,549 | 484,482,234 | 145,589,729 | 369,529,246 | 70,755,280 | 32,488,573 | 25,505,981 | 31,237,346 | 32,993,517 | 3,854,718 | 65,630,498 | 2,537,408,671 |

TOTAL SCALE SEGREGATED, SHOWING LAND STATUS (IN F.B.M.).

| Forest District. | Timber Licences. | Timber Leases. | Hand-loggers' Licences. | Timber-sales. | Pre-emptions, S.R., and Miscellaneous. | Crown Grants. | | | | Dominion Lands. | Totals. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | To 1887. | 1887–1906. | 1906–1914. | 1914 to Date. | | |
| Vancouver | 676,844,665 | 319,335,286 | ..... | 200,993,230 | 14,157,309 | 986,823,595 | 33,912,381 | 27,250,946 | 34,103,065 | 11,019,849 | 2,304,440,326 |
| Prince Rupert, Coast | 68,422,248 | 135,154 | 2,902,009 | 37,378,413 | 184,444 | ..... | 17,199 | 337,873 | 1,967,483 | 996,937 | 112,341,760 |
| Prince Rupert, Interior | 14,810 | ..... | ..... | 13,360,329 | 911,353 | ..... | ..... | 2,009,933 | 1,608,783 | 698,102 | 18,603,310 |
| Fort George | 2,452,406 | ..... | ..... | 46,468,110 | 7,396,227 | 14,444 | 93,380 | 4,740,846 | 3,443,418 | ..... | 64,608,831 |
| Kamloops | 29,377,890 | ..... | ..... | 66,291,419 | 4,740,897 | 14,119,206 | 4,660,745 | 10,697,390 | 6,527,675 | 904,347 | 137,319,569 |
| Nelson | 15,777,977 | ..... | ..... | 49,523,223 | 5,458,178 | 152,025 | 59,189,034 | 6,869,314 | 4,750,451 | ..... | 141,720,202 |
| Totals, 1938 | 792,889,996 | 319,470,440 | 2,902,009 | 414,014,724 | 32,848,408 | 1,001,109,270 | 97,872,739 | 51,906,302 | 52,400,875 | 13,619,235 | 2,779,033,998 |
| Totals, 1937 | 892,984,935 | 535,278,037 | 3,026,150 | 446,383,536 | 45,283,239 | 1,066,993,708 | 129,477,697 | 60,992,751 | 43,208,437 | 18,287,150 | 3,241,915,640 |
| Totals, 1936 | 817,358,715 | 659,196,593 | 3,963,393 | 361,804,289 | 26,314,600 | 933,760,894 | 102,814,341 | 56,461,309 | 48,552,539 | 10,546,521 | 3,020,773,194 |
| Totals, 1935 | 749,516,819 | 549,472,826 | 5,324,156 | 269,381,544 | 28,073,266 | 817,442,350 | 109,307,343 | 71,557,217 | 40,560,673 | 8,652,201 | 2,649,288,395 |
| Totals, 1934 | 607,248,479 | 401,366,932 | 7,084,960 | 247,602,363 | 29,349,240 | 707,095,539 | 103,412,413 | 55,048,755 | 37,247,321 | 19,335,867 | 2,214,791,869 |
| Totals, 1933 | 506,071,513 | 329,648,907 | 8,366,034 | 160,558,274 | 25,327,310 | 692,183,179 | 116,367,136 | 25,297,282 | 27,923,268 | 6,838,161 | 1,898,581,064 |
| Totals, 1932 | 399,082,165 | 390,494,128 | 5,303,122 | 198,277,128 | 24,259,207 | 440,264,407 | 70,534,985 | 28,558,367 | 37,982,900 | 16,702,052 | 1,611,458,461 |
| Totals, 1931 | 283,982,547 | 386,584,819 | 4,938,797 | 238,645,632 | 35,381,654 | 647,262,567 | 165,875,691 | 41,867,865 | 31,120,290 | 112,744,411 | 1,948,404,273 |
| Totals, 1930 | 474,717,322 | 420,727,159 | 5,413,150 | 321,230,000 | 25,830,560 | 888,519,895 | 226,834,133 | 69,744,896 | 44,489,545 | 186,245,678 | 2,663,752,338 |
| Ten-year average, 1929–38 | 609,903,554 | 436,656,368 | 5,223,014 | 304,126,850 | 29,778,055 | 841,833.637 | 140,967,573 | 56,086,668 | 42,268,320 | 70,564,632 | 2,537,408,671 |

Timber from lands in the former Dominion Government Railway Belt which has passed over to the jurisdiction of this Province is included under the various land status headings shown above.

Only timber from Indian Reserves and other lands still under the jurisdiction of the Dominion Government is shown under the heading "Dominion Lands."

TIMBER SCALED IN BRITISH COLUMBIA IN 1938 (BY MONTHS AND DISTRICTS).

| Month. | | Vancouver. | Prince Rupert, Coast. | Prince Rupert, Interior. | Fort George. | Kamloops. | Nelson. | Total, F.B.M. | Total Lineal Feet. | Total Cords. | Total Hewn Ties. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| January | F.B.M. | 131,497,949 | 2,870,402 | 331,789 | 2,265,439 | 3,638,837 | 4,289,388 | 144,893,804 | | | |
| ,, | lineal ft. | 299,924 | 4,167 | 99,250 | 111,343 | 314,636 | 125,559 | | 954,879 | | |
| ,, | cords | 7,296 | | 495 | 977 | 2,820 | 2,443 | | | 14,031 | |
| ,, | hewn ties | 3,651 | | 2,331 | 7,378 | 3,015 | 7,831 | | | | 24,206 |
| February | F.B.M. | 75,709,586 | 347,720 | 472,908 | 2,861,999 | 2,542,729 | 8,727,550 | 90,662,492 | | | |
| ,, | lineal ft. | 219,769 | | 126,425 | 29,095 | 222,871 | 94,900 | | 693,060 | | |
| ,, | cords | 5,281 | | 100 | 1,810 | 2,110 | 2,269 | | | 11,570 | |
| ,, | hewn ties | 407 | | 340 | 20,232 | 5,343 | 1,653 | | | | 27,975 |
| March | F.B.M. | 120,744,250 | 943,022 | 198,401 | 2,405,575 | 2,342,204 | 5,659,251 | 132,292,703 | | | |
| ,, | lineal ft. | 296,831 | 7,260 | 550 | 18,196 | 182,114 | 37,928 | | 542,879 | | |
| ,, | cords | 9,543 | | | 655 | 1,198 | 1,201 | | | 12,597 | |
| ,, | hewn ties | 5,333 | | 1,175 | 13,825 | 43,398 | 3,574 | | | | 67,305 |
| April | F.B.M. | 192,094,809 | 2,386,200 | 308,484 | 2,214,442 | 3,457,797 | 4,090,354 | 204,552,086 | | | |
| ,, | lineal ft. | 316,923 | 3,756 | 152,890 | 58,529 | 90,542 | 68,737 | | 691,377 | | |
| ,, | cords | 7,983 | 50 | 88 | 2,174 | 1,325 | 1,757 | | | 13,377 | |
| ,, | hewn ties | 5,945 | | 6,474 | 36,252 | 59,153 | 20,077 | | | | 127,901 |
| May | F.B.M. | 258,709,110 | 9,296,196 | 1,078,448 | 1,053,863 | 10,143,472 | 5,900,782 | 286,181,871 | | | |
| ,, | lineal ft. | 399,714 | 3,866 | 31,705 | 21,960 | 138,657 | 132,358 | | 728,260 | | |
| ,, | cords | 10,152 | | 161 | 111 | 1,057 | 2,686 | | | 14,167 | |
| ,, | hewn ties | 3,875 | | 5,999 | 44,839 | 46,863 | 91,286 | | | | 192,862 |
| June | F.B.M. | 262,695,318 | 24,403,369 | 785,223 | 1,058,549 | 8,589,926 | 11,575,320 | 309,107,705 | | | |
| ,, | lineal ft. | 1,090,557 | 8,082 | 90,575 | 38,201 | 365,986 | 90,749 | | 1,684,150 | | |
| ,, | cords | 8,655 | 20 | 18 | 483 | 1,938 | 1,289 | | | 12,403 | |
| ,, | hewn ties | 2,308 | | 23,847 | 18,281 | 97,293 | 36,988 | | | | 178,717 |
| July | F.B.M. | 159,787,379 | 15,593,603 | 1,052,537 | 10,329,544 | 13,646,342 | 11,241,282 | 211,650,687 | | | |
| ,, | lineal ft. | 685,944 | 20,908 | 103,986 | 99,855 | 625,743 | 405,810 | | 1,942,246 | | |
| ,, | cords | 10,753 | 179 | 270 | 30 | 3,704 | 2,004 | | | 16,940 | |
| ,, | hewn ties | 640 | | 14,647 | 9,461 | 63,959 | 26,355 | | | | 115,062 |
| August | F.B.M. | 102,327,211 | 25,217,507 | 832,616 | 4,052,908 | 10,926,209 | 20,425,678 | 163,782,129 | | | |
| ,, | lineal ft. | 739,381 | 63,603 | 170,635 | 98,020 | 1,087,008 | 226,442 | | 2,385,089 | | |
| ,, | cords | 5,041 | 301 | 114 | 766 | 1,205 | 1,499 | | | 8,926 | |
| ,, | hewn ties | 217 | | 32,670 | 7,098 | 71,909 | 29,754 | | | | 141,648 |
| September | F.B.M. | 186,354,029 | 12,344,320 | 679,958 | 3,599,281 | 9,399,656 | 17,292,343 | 229,669,587 | | | |
| ,, | lineal ft. | 281,298 | 52,143 | 83,834 | 26,655 | 951,659 | 407,736 | | 1,803,325 | | |
| ,, | cords | 12,817 | 360 | 422 | 159 | 2,246 | 1,877 | | | 17,881 | |
| ,, | hewn ties | 1,119 | | 18,793 | 33,542 | 35,457 | 15,440 | | | | 104,351 |
| October | F.B.M. | 252,563,526 | 9,715,186 | 268,132 | 14,404,920 | 9,140,562 | 11,227,257 | 297,319,583 | | | |
| ,, | lineal ft. | 482,367 | 43,221 | 256,742 | 141,117 | 1,297,535 | 190,291 | | 2,411,273 | | |
| ,, | cords | 7,018 | 10 | 1,268 | 903 | 2,221 | 3,224 | | | 14,634 | |
| ,, | hewn ties | 185 | | 44,899 | 24,810,903 | 12,307 | 4,033 | | | | 86,234 |
| November | F.B.M. | 263,650,808 | 7,337,537 | 164,350 | 2,810,952 | 6,686,716 | 8,203,672 | 288,854,035 | | | |
| ,, | lineal ft. | 395,184 | 19,620 | 58,095 | 56,772 | 946,665 | 329,353 | | 1,805,689 | | |
| ,, | cords | 11,145 | 50 | | 1,250 | 2,588 | 2,995 | | | 18,028 | |
| ,, | hewn ties | 1,486 | | 10,214 | 1,417 | 11,626 | 8,203 | | | | 32,946 |
| December | F.B.M. | 211,357,357 | 711,040 | 166,291 | 1,127,441 | 5,479,522 | 3,470,282 | 222,311,933 | | | |
| ,, | lineal ft. | 67,026 | 2,760 | 154,884 | 37,643 | 555,523 | 89,318 | | 907,154 | | |
| ,, | cords | 8,946 | 5 | 133 | 1,198 | 3,287 | 2,509 | | | 16,078 | |
| ,, | hewn ties | 195 | | 7,135 | 6,709 | 1,079 | 4,121 | | | | 19,239 |
| Totals for year | F.B.M. | 2,217,491,332 | 111,166,102 | 6,339,137 | 48,184,913 | 85,993,972 | 112,103,159 | 2,581,278,615 | | | |
| ,, | lineal ft. | 5,274,918 | 229,386 | 1,329,571 | 737,386 | 6,778,939 | 2,199,181 | | 16,549,381 | | |
| ,, | cords | 104,630 | 975 | 3,069 | 10,516 | 25,689 | 25,753 | | | 170,632 | |
| ,, | hewn ties | 25,361 | | 168,524 | 223,844 | 451,402 | 249,315 | | | | 1,118,446 |

Total scale in F.B.M.=2,779,033,998.

## Logging Inspection.

| Forest District. | Operations. | | | | No. of Inspections. |
|---|---|---|---|---|---|
| | Timber-sales. | Hand-loggers' Licences. | Leases, Licences, Crown Grants, and Pre-emptions. | Totals. | |
| Vancouver | 664 | 1 | 752 | 1,417 | 3,569 |
| Prince Rupert | 391 | 22 | 105 | 518 | 1,825 |
| Fort George | 463 | ..... | 193 | 656 | 1,180 |
| Kamloops | 760 | ..... | 432 | 1,192 | 2,396 |
| Nelson | 396 | ..... | 322 | 718 | 1,858 |
| Totals, 1938 | 2,674 | 23 | 1,804 | 4,501 | 10,828 |
| Totals, 1937 | 2,404 | 46 | 1,932 | 4,382 | 11,507 |
| Totals, 1936 | 2,354 | 35 | 1,883 | 4,272 | 11,138 |
| Totals, 1935 | 2,074 | 59 | 1,660 | 3,793 | 10,081 |
| Totals, 1934 | 1,603 | 87 | 1,546 | 3,236 | 9,486 |
| Totals, 1933 | 1,237 | 67 | 1,425 | 2,729 | 8,121 |
| Totals, 1932 | 1,124 | 37 | 1,316 | 2,477 | 7,273 |
| Totals, 1931 | 1,562 | 92 | 1,675 | 3,329 | 8,969 |
| Totals, 1930 | 1,932 | 100 | 1,862 | 3,894 | 8,859 |
| Ten-year average, 1929–38 | 1,887 | 65 | 1,710 | 3,662 | 9,577 |

## Trespasses.

| Forest District. | No. of Cases. | Areas cut over (Acres). | Quantity cut. | | | | | No. of Resulting Seizures. | Amount. |
|---|---|---|---|---|---|---|---|---|---|
| | | | Feet B.M. | Lineal Feet. | Cords. | Ties. | Christmas Trees. | | |
| Vancouver | 58 | 383 | 3,416,890 | 7,000 | 975 | ..... | ..... | 4 | $5,825.48 |
| Prince Rupert | 15 | 70 | 444,890 | 142,875 | 1,279 | 115 | ..... | 0 | 1,512.38 |
| Fort George | 26 | 103 | 189,520 | 4,890 | 390 | 800 | ..... | 1 | 505.20 |
| Kamloops | 29 | 206 | 172,000 | 34,360 | 230 | 270 | 4,040 | 3 | 1,225.40 |
| Nelson | 21 | 54 | 85,730 | 14,050 | 140 | ..... | 3,490 | 2 | 585.40 |
| Totals, 1938 | 149 | 816 | 4,309,030 | 203,195 | 3,014 | 1,185 | 7,530 | 10 | $9,653.86 |
| Totals, 1937 | 156 | 1,147 | 8,239,813 | 143,860 | 1,607 | 2,132 | 35,017 | 7 | $17,439.52 |
| Totals, 1936 | 153 | 501 | 2,067,130 | 75,272 | 1,632 | 2,452 | ..... | 13 | $5,243.00 |
| Totals, 1935 | 121 | 555 | 3,043,486 | 50,965 | 1,283 | 14,078 | ..... | 3 | $6,077.58 |
| Totals, 1934 | 101 | 720 | 3,270,608 | 30,555 | 1,385 | 4,825 | ..... | 6 | $5,401.05 |
| Totals, 1933 | 70 | 155 | 1,578,108 | 41,689 | 1,413 | 3,807 | ..... | 2 | $2,727.81 |
| Totals, 1932 | 95 | 368 | 767,896 | 35,484 | 2,140 | 9,265 | ..... | 14 | $3,490.84 |
| Totals, 1931 | 84 | 397 | 1,579,465 | 118,704 | 1,048 | 12,425 | ..... | 2 | $5,633.68 |
| Totals, 1930 | 96 | 1,000 | 969,351 | 165,729 | 1,457 | 9,612 | ..... | 4 | $7,534.01 |
| Ten-year average, 1929–38 | 112 | 602 | 2,680,919 | 95,445 | 1,555 | 6,569 | ..... | 7 | $6,863.24 |

## PRE-EMPTION INSPECTION.

| Pre-emption records examined by districts are:— | 1938. | Average, Ten Yrs. 1929–38. |
|---|---|---|
| Vancouver | 264 | 325 |
| Prince Rupert | 180 | 227 |
| Fort George | 495 | 639 |
| Kamloops | 712 | 712 |
| Nelson | 165 | 184 |
| Total | 1,816 | 2,087 |

### AREAS EXAMINED FOR MISCELLANEOUS PURPOSES OF THE "LAND ACT," 1938.

| Forest District. | Applications for Hay and Grazing Leases. | | Applications for Pre-emption Records. | | Application to Purchase. | | Miscellaneous. | |
|---|---|---|---|---|---|---|---|---|
| | No. | Acres. | No. | Acres. | No. | Acres. | No. | Acres. |
| Vancouver | ---- | ------ | 11 | 488 | 24 | 2,138 | 52 | 1,548 |
| Prince Rupert | 1 | 80 | 10 | 1,480 | 4 | 191 | 20 | 906 |
| Fort George | 11 | 1,141 | 12 | 1,714 | 6 | 303 | 8 | 757 |
| Kamloops | 50 | 13,731 | 32 | 3,916 | 28 | 1,808 | 53 | 4,488 |
| Nelson | 1 | 37 | 2 | 10 | 17 | 1,566 | 13 | 1,644 |
| Totals | 63 | 14,989 | 67 | 7,608 | 79 | 6,006 | 146 | 9,343 |

### CLASSIFICATION OF AREAS EXAMINED IN 1938.

| Forest District. | Total Area. | Agricultural Land. | Non-agricultural Land. | Merchantable Timber Land. | Estimated Timber on Merchantable Timber Land. |
|---|---|---|---|---|---|
| | Acres. | Acres. | Acres. | Acres. | M.B.M. |
| Vancouver | 4,174 | 1,512 | 2,662 | 807 | 3,003 |
| Prince Rupert | 2,657 | 1,434 | 1,223 | 18 | 113 |
| Fort George | 3,915 | 1,863 | 2,052 | 119 | 1,316 |
| Kamloops | 23,943 | 5,282 | 18,661 | 40 | 210 |
| Nelson | 3,257 | 1,712 | 1,545 | ----- | ------ |
| Totals | 37,946 | 11,803 | 26,143 | 984 | 4,642 |

## Areas cruised for Timber-sales.

| Forest District. | Number cruised. | Acreage. | Saw-timber (M.B.M.). | Poles and Piles (Lineal Ft.). | Shingle-bolts and Cordwood (Cords). | Railway-ties (No.). | Car Stakes and Posts (No.). |
|---|---|---|---|---|---|---|---|
| Vancouver | 473 | 71,343 | 262,704 | 644,333 | 66,395 | 6,400 | ..... |
| Prince Rupert | 228 | 40,578 | 34,128 | 750,450 | 1,976 | 237,525 | ..... |
| Fort George | 196 | 31,674 | 44,673 | 721,291 | 21,186 | 217,751 | 15,700 |
| Kamloops | 416 | 132,860 | 63,378 | 2,789,495 | 26,132 | 261,936 | ..... |
| Nelson | 173 | 48,948 | 77,797 | 824,196 | 10,640 | 80,628 | 154,200 |
| Totals, 1938 | 1,486 | 325,403 | 482,680 | 5,747,765 | 126,329 | 804,240 | 169,900 |
| Totals, 1937 | 1,471 | 278,386 | 633,216 | 9,658,000 | 140,820 | 753,408 | 160,450 |
| Totals, 1936 | 1,415 | 252,035 | 464,402 | 8,535,045 | 148,606 | 1,083,746 | 63,200 |
| Totals, 1935 | 1,319 | 238,952 | 398,884 | 5,674,908 | 114,753 | 1,164,454 | 74,700 |
| Totals, 1934 | 1,331 | 223,391 | 356,264 | 2,856,619 | 80,101 | 1,235,766 | 73,766 |
| Totals, 1933 | 942 | 169,831 | 186,418 | 1,620,112 | 95,233 | 549,976 | 174,861 |
| Totals, 1932 | 875 | 144,769 | 202,421 | 1,759,905 | 68,414 | 488,655 | 69,900 |
| Totals, 1931 | 818 | 145,214 | 297,825 | 2,629,054 | 62,680 | 664,413 | 142,400 |
| Totals, 1930 | 943 | 197,065 | 526,261 | 10,345,822 | 26,431 | 731,640 | 620,100 |
| Ten-year average, 1929–38 | 1,165 | 218,992 | 404,897 | 6,187,083 | 88,099 | 878,141 | 173,502 |

## Timber-sales awarded by Districts, 1938.

| Forest District. | No. of Sales. | Acre-age. | Sawn Timber (F.B.M.) | Poles and Piles (Lin. Ft.). | No. of Posts. | No. of Cords. | No. of Ties. | No. of Xmas Trees. | Estimated Revenue. |
|---|---|---|---|---|---|---|---|---|---|
| Vancouver | 449 | 73,001 | 226,439,000 | 580,168 | ..... | 67,839 | 11,200 | ..... | $663,330.54 |
| Prince Rupert | 218 | 42,735 | 60,432,000 | 676,150 | ..... | 1,878 | 181,655 | ..... | 140,450.26 |
| Fort George | 171 | 27,909 | 26,664,000 | 999,430 | 29,100 | 9,030 | 136,982 | ..... | 81,244.32 |
| Kamloops | 437 | 81,150 | 46,038,000 | 2,884,093 | 150,506 | 29,256 | 226,856 | 66,793 | 181,091.12 |
| Nelson | 226 | 49,629 | 56,174,000 | 794,645 | 112,300 | 12,850 | 90,698 | 30,272 | 137,769.13 |
| Totals, 1938 | 1,501 | 274,424 | 415,747,000 | 5,934,486 | 291,906 | 120,853 | 647,391 | 97,065 | $1,203,885.37 |
| Totals, 1937 | 1,449 | 278,988 | 450,798,000 | 9,864,973 | 363,950 | 122,143 | 644,223 | ..... | $1,271,475.20 |
| Totals, 1936 | 1,443 | 252,624 | 358,804,000 | 8,332,542 | 235,600 | 122,979 | 823,181 | ..... | $1,082,793.87 |
| Totals, 1935 | 1,357 | 231,958 | 260,831,000 | 5,408,377 | 308,825 | 101,966 | 1,200,582 | ..... | $762,427.04 |
| Totals, 1934 | 1,324 | 219,969 | 250,629,000 | 2,721,540 | 316,910 | 67,902 | 894,970 | ..... | $705,038.99 |
| Totals, 1933 | 948 | 190,794 | 145,696,000 | 2,490,244 | 295,905 | 76,777 | 432,513 | ..... | $450,559.16 |
| Totals, 1932 | 836 | 134,868 | 181,470,000 | 1,746,616 | 161,600 | 54,154 | 423,676 | ..... | $450,528.10 |
| Ten-year average, 1929–38 | 1,154 | 211,041 | 317,306,000 | 5,809,086 | 292,021 | 75,100 | 767,285 | ..... | $914,888.60 |

## Average Sale Price for Species.

| Sawn Timber. | Figures for 1938. | | Figures for 1937. | | Ten-year Average, 1929–38. | |
|---|---|---|---|---|---|---|
| | Board-feet. | Price per M. | Board-feet. | Price per M. | Board-feet. | Price per M. |
| Douglas fir | 154,698,000 | $1.46 | 174,804,000 | $1.31 | 973,014,000 | $1.28 |
| Cedar | 58,274,000 | 1.17 | 61,853,000 | 1.16 | 352,885,000 | 1.23 |
| Spruce | 57,770,000 | 1.32 | 68,518,000 | 1.16 | 661,314,000 | 1.36 |
| Hemlock | 69,193,000 | .72 | 78,607,000 | .70 | 494,659,000 | .75 |
| Balsam | 19,988,000 | .70 | 25,963,000 | .70 | 149,924,000 | .78 |
| White pine | 6,608,000 | 2.05 | 7,644,000 | 1.95 | 71,164,000 | 1.89 |
| Western soft pine | 20,709,000 | 1.48 | 17,313,000 | 1.59 | 150,793,000 | 1.39 |
| Tamarac | 22,041,000 | .86 | 9,350,000 | .77 | 66,776,000 | .96 |
| Other species | 6,466,000 | .82 | 6,746,000 | .85 | 70,555,000 | .86 |
| Totals | 415,747,000 | $1.21 | 450,798,000 | $1.13 | 2,991,085,000 | $1.19 |

## Timber cut from Timber-sales during 1938.

| District. | Feet B.M. | Lineal Feet. | Cords. | Ties. | Posts. | Xmas Trees. |
|---|---|---|---|---|---|---|
| Vancouver | 175,394,920 | 1,176,828 | 35,143 | 7,733 | 844 | ..... |
| Prince Rupert | 41,499,145 | 1,256,793 | 1,576 | 153,120 | 33,390 | ..... |
| Fort George | 37,147,712 | 577,555 | 5,515 | 158,216 | 12,814 | ..... |
| Kamloops | 41,925,821 | 4,159,540 | 8,544 | 241,555 | 56,061 | 58,354 |
| Nelson | 39,013,856 | 1,039,895 | 6,562 | 88,022 | 72,197 | ..... |
| Totals, 1938 | 334,981,454 | 8,223,100 | 57,340 | 648,646 | 175,306 | 58,354 |
| Totals, 1937 | 384,628,267 | 8,603,582 | 49,981 | 724,483 | 197,859 | ..... |
| Totals, 1936 | 286,001,433 | 5,241,658 | 62,763 | 813,764 | 154,630 | ..... |
| Totals, 1935 | 193,788,636 | 3,540,576 | 38,438 | 851,342 | 149,959 | ..... |
| Totals, 1934 | 199,895,549 | 1,694,470 | 36,209 | 503,266 | 84,312 | ..... |
| Totals, 1933 | 122,275,912 | 1,337,497 | 35,841 | 212,824 | 164,586 | ..... |
| Totals, 1932 | 165,666,929 | 1,583,955 | 30,647 | 258,284 | 79,885 | ..... |
| Ten-year average, 1929–38 | 240,744,750 | 5,584,827 | 36,856 | 757,103 | 193,287 | ..... |

## Saw and Shingle Mills of the Province.

| Forest District. | Operating. | | | | Shut Down. | | | |
|---|---|---|---|---|---|---|---|---|
| | Sawmills. | | Shingle-mills. | | Sawmills. | | Shingle-mills. | |
| | No. | Estimated Daily Capacity, M.B.M. | No. | Estimated Daily Capacity, Shingles, M. | No. | Estimated Daily Capacity, M.B.M. | No. | Estimated Daily Capacity, Shingles, M. |
| Vancouver | 191 | 8,656 | 73 | 7,992 | 43 | 612 | 15 | 183 |
| Prince Rupert | 43 | 530 | 4 | 79 | 17 | 154 | ----- | ------- |
| Fort George | 50 | 690 | ----- | ------- | 15 | 148 | ----- | ------- |
| Kamloops | 112 | 1,058 | 4 | 33 | 37 | 187 | 3 | 112 |
| Nelson | 85 | 1,225 | 7 | 80 | 14 | 305 | 1 | 20 |
| Totals, 1938 | 481 | 12,159 | 88 | 8,184 | 126 | 1,406 | 19 | 315 |
| Totals, 1937 | 434 | 11,042 | 80 | 9,124 | 131 | 1,685 | 16 | 402 |
| Totals, 1936 | 410 | 11,401 | 86 | 8,859 | 122 | 1,699 | 10 | 315 |
| Totals, 1935 | 384 | 9,822 | 93 | 8,492 | 96 | 1,962 | 16 | 1,231 |
| Totals, 1934 | 349 | 9,152 | 82 | 7,311 | 129 | 2,999 | 13 | 1,228 |
| Totals, 1933 | 295 | 8,715 | 78 | 7,325 | 134 | 3,632 | 22 | 1,652 |
| Totals, 1932 | 293 | 7,641 | 45 | 6,813 | 139 | 4,621 | 13 | 1,470 |
| Totals, 1931 | 334 | 10,167 | 46 | 7,470 | 158 | 4,109 | 19 | 1,871 |
| Totals, 1930 | 301 | 11,020 | 43 | 7,164 | 141 | 3,204 | 17 | 1,695 |
| Ten-year average, 1929–38 | 363 | 10,302 | 69 | 7,862 | 127 | 2,751 | 16 | 1,190 |

## Export of Logs (in F.B.M.).

| Species. | Grade No. 1. | Grade No. 2. | Grade No. 3. | Ungraded. | Totals. |
|---|---|---|---|---|---|
| Fir | 3,506,679 | 67,275,101 | 36,885,040 | ..... | 107,666,820 |
| Cedar | 797,166 | 23,260,499 | 22,635,419 | ..... | 46,693,084 |
| Spruce | 82,525 | 7,974,523 | 13,936,507 | ..... | 21,993,555 |
| Cottonwood | ..... | 127,367 | 1,193,687 | ..... | 1,321,054 |
| Hemlock | ..... | ..... | ..... | 74,753,044 | 74,753,044 |
| Balsam | ..... | ..... | ..... | 5,709,214 | 5,709,214 |
| White pine | ..... | ..... | ..... | 887,676 | 887,676 |
| Larch | ..... | ..... | ..... | 96,000 | 96,000 |
| Lodgepole pine | ..... | ..... | ..... | 163,000 | 163,000 |
| Miscellaneous | ..... | ..... | ..... | 389,635 | 389,635 |
| Totals, 1938 | 4,386,370 | 98,637,490 | 74,650,653 | 81,998,569 | 259,673,082 |
| Totals, 1937 | 4,924,298 | 114,991,217 | 66,611,218 | 83,947,361 | 270,474,094 |
| Totals, 1936 | 4,028,567 | 107,007,342 | 49,061,362 | 58,731,564 | 218,828,835 |
| Totals, 1935 | 8,766,098 | 129,029,692 | 56,979,194 | 40,516,782 | 235,291,766 |
| Totals, 1934 | 10,489,155 | 89,831,736 | 43,416,151 | 28,998,709 | 172,735,751 |
| Totals, 1933 | 16,941,207 | 119,089,573 | 59,215,094 | 13,694,960 | 208,940,834 |
| Totals, 1932 | 18,572,020 | 87,223,114 | 44,380,166 | 15,589,383 | 165,764,683 |
| Totals, 1931 | 12,886,187 | 106,331,594 | 51,909,961 | 49,048,420 | 220,176,162 |
| Totals, 1930 | 11,571,481 | 86,502,990 | 40,147,841 | 34,696,715 | 172,919,027 |
| Ten-year average, 1929–38 | 10,558,053 | 107,265,733 | 54,637,435 | 43,720,058 | 216,181,279 |

## Shipments of Poles, Piling, Mine-props, Fence-posts, Railway-ties, etc.

| Forest District. | | Quantity exported. | Approximate Value, F.O.B. | Where marketed. | |
|---|---|---|---|---|---|
| | | | | United States. | Canada. |
| Vancouver— | | | | | |
| Poles | lineal ft. | 3,836,009 | $383,600 | 3,836,009 | ..... |
| Piling | lineal ft. | 25,406 | 3,048 | 25,406 | ..... |
| Car stakes and stickers | cords | 54 | 645 | 54 | ..... |
| Pulp-wood | cords | 75 | 375 | 75 | ..... |
| Cedar shakes | cords | 6 | 110 | 6 | ..... |
| Shingle-bolts | cords | 31 | 315 | 31 | ..... |
| Prince Rupert— | | | | | |
| Poles and piling | lineal ft. | 1,121,366 | 97,993 | 682,365 | 439,001 |
| Hewn railway-ties | No. | 102,326 | 53,321 | ..... | 102,326 |
| Fence-posts | No. | 25,976 | 5,218 | ..... | 25,976 |
| Fort George— | | | | | |
| Poles | lineal ft. | 312,679 | 25,014 | 177,585 | 135,094 |
| Fence-posts | cords | 208 | 1,248 | ..... | 208 |
| Hewn railway-ties | No. | 130,456 | 60,110 | ..... | 130,456 |
| Mine-timbers | lineal ft. | 23,330 | 1,866 | ..... | 23,330 |
| Cordwood | cords | 17 | 102 | ..... | 17 |
| Kamloops— | | | | | |
| Poles and piling | lineal ft. | 6,237,760 | 623,740 | 5,327,760 | 909,640 |
| Fence-posts | cords | 954 | 8,106 | ..... | 954 |
| Mine-timbers | lineal ft. | 12,040 | 662 | ..... | 12,040 |
| Hewn railway-ties | No. | 305,162 | 152,581 | ..... | 305,162 |
| Cordwood | cords | 345 | 1,380 | ..... | 345 |
| Nelson— | | | | | |
| Poles | lineal ft. | 1,023,805 | 102,381 | 966,460 | 57,345 |
| Piles | lineal ft. | 29,670 | 1,780 | ..... | 29,670 |
| Fence-posts | cords | 6,324 | 50,592 | 848 | 5,476 |
| Hewn railway-ties | No. | 168,533 | 84,267 | ..... | 168,533 |
| Mine-props | cords | 5,043 | 40,344 | ..... | 5,043 |
| Total value, 1938 | | ..... | $1,698,798 | ..... | ..... |
| Total value, 1937 | | ..... | $2,610,116 | ..... | ..... |

## TIMBER-MARKING.

### Timber-marks issued for the Years 1936, 1937, and 1938.

| | 1936. | 1937. | 1938. |
|---|---|---|---|
| Old Crown grants | 267 | 298 | 258 |
| Crown grants, 1887–1906 | 85 | 86 | 103 |
| Crown grants, 1906–1914 | 102 | 129 | 124 |
| Section 57, "Forest Act" | 285 | 282 | 272 |
| Stumpage reservations | 73 | 69 | 59 |
| Pre-emptions under sections 28 and 29, "Land Act" | 5 | 3 | ------ |
| Timber berths | 17 | 9 | 9 |
| Indian reserves | 13 | 18 | 6 |
| Timber-sales | 1,443 | 1,451 | 1,501 |
| Hand-loggers | 11 | 4 | 3 |
| Special marks | 5 | 1 | 6 |
| Pulp leases | 2 | 1 | ------ |
| Pulp licences | 2 | 1 | 1 |
| Totals | 2,310 | 2,352 | 2,342 |
| Transfers and changes of marks | 264 | 339 | 321 |

### Draughting Office, Forest Branch, 1938.

| Month. | Number of Tracings made. | | | | | Blue-prints from Reference Maps. |
|---|---|---|---|---|---|---|
| | Timber-sales. | Timber-marks. | Examination Sketches. | Miscel-laneous. | Totals. | |
| January | 25 | 96 | 27 | 31 | 179 | 7 |
| February | 38 | 106 | 13 | 42 | 199 | 7 |
| March | 35 | 124 | 35 | 20 | 214 | 4 |
| April | 17 | 103 | 29 | 36 | 185 | 21 |
| May | 23 | 118 | 32 | 26 | 199 | 2 |
| June | 30 | 85 | 30 | 25 | 170 | 4 |
| July | 20 | 74 | 25 | 49 | 168 | 7 |
| August | 17 | 63 | 12 | 20 | 112 | 7 |
| September | 19 | 46 | 28 | 11 | 104 | 11 |
| October | 13 | 79 | 52 | 15 | 159 | 15 |
| November | 11 | 57 | 31 | 32 | 131 | 32 |
| December | 20 | 72 | 26 | 9 | 127 | 9 |
| Totals | 268 | 1,023 | 340 | 316 | 1,947 | 126 |

CROWN-GRANTED TIMBER LANDS.

| Year. | Area of Private Timber Lands (Acres). | Average Value per Acre. |
|---|---|---|
| 1921 | 845,111 | 10.33 |
| 1922 | 887,980 | 11.99 |
| 1923 | 883,344 | 11.62 |
| 1924 | 654,668 | 15.22 |
| 1925 | 654,016 | 40.61 |
| 1926 | 688,372 | 39.77 |
| 1927 | 690,438 | 39.01 |
| 1928 | 671,131 | 38.62 |
| 1929 | 644,011 | 38.41 |
| 1930 | 629,156 | 44.74 |
| 1931 | 602,086 | 43.77 |
| 1932 | 552,007 | 43.73 |
| 1933 | 567,731 | 41.18 |
| 1934 | 557,481 | 37.25 |
| 1935 | 535,918 | 37.13 |
| 1936 | 515,924 | 36.61 |
| 1937 | 743,109 | 23.32 |
| 1938 | 754,348 | 23.05 |

The extent and value of timber land in the various assessment districts are shown by the following table:—

| Assessment District. | Acreage, 1938. | Increase or Decrease in Acreage over 1937. | Average Value per Acre. | Change in Value per Acre since 1937. |
|---|---|---|---|---|
| Alberni | 77,788 | — 759 | 45.39 | — .75 |
| Comox | 129,617 | — 366 | 28.64 | — 1.70 |
| Cowichan | 93,298 | + 3,258 | 38.03 | — 2.42 |
| Fort Steele | 39,741 | — 1 | 5.05 | — .44 |
| Galiano, Mayne, and Pender Islands | 328 | * | 14.99 | * |
| Golden | 9,488 | — 1,225 | 5.71 | — 1.32 |
| Kettle River | 2,595 | * | 7.91 | — .01 |
| Nanaimo | 90,023 | + 6,844 | 36.57 | + .27 |
| Nelson | 3,330 | * | 6.10 | * |
| Omineca (new district) | 629 | + 629 | 5.03 | + 5.03 |
| Prince George | 12,397 | * | 18.63 | + .08 |
| Prince Rupert | 22,578 | + 114 | 17.35 | — .03 |
| Revelstoke | 37,345 | * | 13.91 | * |
| Slocan | 199,212 | * | 2.16 | * |
| Vancouver | 1,474 | * | 48.07 | * |
| Victoria | 34,505 | + 2,745 | 39.47 | +13.33 |
| Totals | 754,348 | +11,239 | 23.05 | — .27 |

* No change.

## FINANCE.

From the standpoint of revenue collected, the year 1938 leaves little room for criticism. Even though the log-scale dropped 15 per cent. below that of 1937 it showed a comfortable margin of 10 per cent. above the average of recent years; and income shows favourable comparisons from all angles, totalling 2 per cent. more than in 1937 and 15 per cent. more than the average for the past ten years, in spite of lowered scale. In sources of cut and sources of income, which are closely related, there is no apparent tendency to major changes. Old Crown grants appear to be producing a little larger proportion of the cut than formerly and later Crown grants a little less. Leases and licences maintain a fairly constant proportion of about 40 per cent. and the production from timber-sales shows a modest tendency to increase.

An anticipated reduction in income from rentals is indicated in a drop from about 34 per cent. of the total income to about 27 per cent.; stumpage maintains a very even 15 per cent.; and royalties show a slight upward trend in relation to the total.

As licences and leases are no longer granted, this source of income (principally rentals in the accompanying tables) must of necessity fail in the course of time. The increase during 1938 is directly attributable to the forewarned repeal of section 44 of the "Forest Act." This section provided for the reinstatement of licences long in arrears, and some hundreds of licences were so reinstated during the few months before it was withdrawn, resulting in largely increased rental revenue.

| Log-scale Source. | Million Feet B.M. and per Cent. of Totals. | | | | | |
|---|---|---|---|---|---|---|
| | Annual Average, 1924–28. | | Annual Average, 1934–38. | | 1938. | |
| From Crown grants— | Per Cent. | | Per Cent. | | Per Cent. | |
| Old Crown grants (prior to 1887, no royalty) | 29 | 819 | 33 | 905 | 36 | 1,001 |
| Late Crown grants (after 1887, pay royalty) | 15 | 420 | 8 | 212 | 7 | 202 |
| From Crown lands— | | | | | | |
| Leases and licences (pay royalty and rentals) | 33 | 920 | 45 | 1,265 | 40 | 1,113 |
| Timber-sales (pay stumpage, royalty, and rentals) | 11 | 306 | 13 | 348 | 15 | 414 |
| Miscellaneous | 12 | 363 | 1 | 51 | 2 | 49 |
| Total log-scale | 100 | 2,828 | 100 | 2,781 | 100 | 2,779 |
| Revenue— | (Thousand Dollars.) | | | | | |
| Royalty and tax | 48 | $1,712 | 58 | $1,649 | 55 | $1,710 |
| Stumpage | 16 | 556 | 15 | 413 | 16 | 535 |
| Leases and licences | 34 | 1,207 | 24 | 678 | 27 | 738 |
| Total forest revenue | 100 | $3,548 | 100 | $2,831 | 100 | $3,089 |

Collections as compared with charges continue in a satisfactory state. Some of the chief sources of income cannot be considered as charged; as for example, in the case of licence and lease rentals. If paid they constitute revenue. If they are not paid the licence or lease lapses, but there is no outstanding account against the holder.

The chief revenue-producing item, royalty, on the other hand, constitutes a definite charge. Under this item collections for the year exceeded the total of accounts issued, and collections over a ten-year period ended 1938 totalled 99.1 per cent. of charges.

Stumpage collections exceeded the year's charges and over a ten-year period have totalled 99.3 per cent. of the sums charged.

In both these items, royalty and stumpage, the 0.9 per cent. and 0.7 per cent. not collected include a normal unpaid balance in outstanding current accounts.

One new account, the Range Improvement Fund, has been added to the published statements this year, and the statement of one other account, the Scaling Fund, has been radically changed.

The Range Improvement Fund is made up of a statutory contribution each year of one-third of the grazing-permit fees collected during the previous year. It is expended on the ranges building drift-fences, fencing mud-holes, improving watering-places, and on any work of common value to the permittees calculated to give commensurate returns in improved grazing conditions. In this first published statement the fund is carried back to its inception in 1920.

The statements of the Scaling Fund previously published have struck a balance between amounts *charged* and expenditure. Collections on this account have been excellent, totalling 98.5 per cent. of amounts charged since the fund was established in 1920, and in the 1.5 per cent. remaining are included normal outstanding current accounts which will be collected in due course. Nevertheless, a system of balancing expenditures against charges involves an accumulating total of accounts not collectable which must give an increasingly erroneous picture of the standing of the fund. In the following pages the cash is carried forward from 1920, when the fund was established, and cash balances will be shown hereafter. Amounts charged will be found if required in the table of "Amounts Charged" (formerly "Revenue from Logging Operations"), published in this report each year.

## FOREST REVENUE.

| | 12 Months to Dec. 31, 1938. | 12 Months to Dec. 31, 1937. | 12 Months to Dec. 31, 1936. | 12 Months to Dec. 31, 1935. | 12 Months to Dec. 31, 1934. | 12 Months to Dec. 31, 1933. | Ten-year Average, 1929–38. |
|---|---|---|---|---|---|---|---|
| Timber-licence rentals | $622,923.79 | $559,371.00 | $610,421.32 | $496,386.11 | $548,816.73 | $331,948.95 | $615,636.54 |
| Timber-licences transfer fees | 1,695.00 | 1,025.00 | 2,165.00 | 1,540.00 | 1,645.00 | 480.00 | 1,476.50 |
| Timber-licence penalty fees | 50,233.98 | 30,918.96 | 50,414.15 | 19,858.46 | 69,302.21 | 16,004.43 | 32,015.98 |
| Hand-loggers' licence fees | 675.00 | 750.00 | 875.00 | 1,075.00 | 1,300.00 | 1,975.00 | 1,247.50 |
| Timber-lease rentals | 61,382.27 | 61,076.23 | 66,625.92 | 68,132.18 | 63,212.79 | 57,859.54 | 67,850.86 |
| Timber-lease penalty fees | 1,417.92 | 166.30 | 422.06 | 1,071.58 | 1,565.97 | 1,265.18 | 921.10 |
| Timber-sale rentals | 25,497.14 | 27,591.39 | 20,454.84 | 17,684.57 | 21,281.83 | 14,061.93 | 21,545.47 |
| Timber-sale stumpage | 534,803.05 | 523,252.96 | 398,868.56 | 319,424.91 | 289,709.62 | 244,225.17 | 419,606.88 |
| Timber-sale cruising | 9,077.20 | 8,573.19 | 8,155.05 | 6,846.88 | 5,706.12 | 3,650.69 | 7,150.12 |
| Timber-sale advertising | 1,562.25 | 1,464.35 | 1,137.90 | 935.60 | 771.30 | 561.25 | 1,098.15 |
| Timber royalty and tax | 1,710,276.43 | 1,881,271.63 | 1,915,462.89 | 1,581,375.23 | 1,155,907.43 | 963,561.61 | 1,461,904.83 |
| Scaling fees (not Scaling Fund) | 527.28 | 229.17 | 321.23 | 312.76 | 334.71 | 225.73 | 584.84 |
| Scaling expenses (not Scaling Fund) | 249.97 | 85.22 | 105.11 | 128.89 | 116.05 | 28.80 | 110.10 |
| Trespass penalties | 15,748.70 | 12,847.49 | 5,526.01 | 7,478.91 | 5,924.39 | 3,399.67 | 7,213.41 |
| Scalers' examination fees | 220.00 | 535.00 | 290.00 | 250.00 | 25.00 | 20.00 | 198.00 |
| Exchange | 130.71 | 209.34 | 282.03 | 123.01 | 123.80 | 350.47 | 399.86 |
| Seizure expenses | 677.15 | 252.01 | 2,020.17 | 237.74 | 260.50 | 1,299.13 | 1,173.13 |
| General miscellaneous | 2,992.00 | 2,769.06 | 3,183.23 | 3,830.19 | 2,745.57 | 3,051.42 | 3,422.42 |
| Timber-berth rentals and bonus | 29,172.82 | 23,574.47 | 26,123.68 | 25,688.94 | 31,631.46 | 30,281.53 | 29,171.22 |
| Interest on timber-berth rentals and bonus | 840.19 | 168.81 | 539.40 | 316.50 | 1,065.42 | 576.41 | 599.16 |
| Transfer fees on timber berths | 56.54 | 85.52 | 80.32 | 55.48 | 199.40 | 28.37 | 104.93 |
| Grazing fees and interest | 18,446.67 | 24,793.27 | 11,768.52 | 14,522.41 | 11,411.56 | 11,759.13 | 14,469.27 |
| | $3,088,606.06 | $3,161,010.37 | $3,125,242.39 | $2,567,275.35 | $2,213,056.86 | $1,686,614.41 | $2,687,900.27 |
| Taxation from Crown-grant timber lands | 290,576.51 | 305,261.27 | 299,992.41 | 309,877.20 | 326,550.10 | 321,596.01 | 344,129.69 |
| Total revenue from forest sources | $3,379,182.57 | $3,466,271.64 | $3,425,234.80 | $2,877,152.55 | $2,539,606.96 | $2,008,210.42 | $3,032,029.96 |

## FOREST REVENUE.

### Fiscal Year 1937–38.

| | | Ten-year Average. |
|---|---|---|
| Timber-licence rentals | $549,033.51 | $644,661.00 |
| Timber-licence transfer fees | 820.00 | 1,579.00 |
| Timber-licence penalty fees | 29,543.00 | 30,551.00 |
| Hand-loggers' licence fees | 825.00 | 1,292.00 |
| Timber-lease rentals | 62,636.41 | 68,165.00 |
| Timber-lease penalty fees and interest | 85.47 | 807.00 |
| Timber-sale rentals | 28,096.52 | 23,080.00 |
| Timber-sale stumpage | 559,225.51 | 422,786.00 |
| Timber-sale cruising | 9,080.03 | 7,315.00 |
| Timber-sale advertising | 1,572.20 | 1,112.00 |
| Timber royalty | 1,880,591.91 | 1,373,688.00 |
| Timber tax | 64,245.91 | 97,092.00 |
| Scaling fees (not Scaling Fund) | 235.99 | 638.00 |
| Scaling expenses (not Scaling Fund) | 93.99 | 97.00 |
| Trespass penalties | 19,261.87 | 6,977.00 |
| Scalers' examination fees | 535.00 | 201.00 |
| Exchange | 177.01 | 258.00 |
| Seizure expenses | 537.60 | 991.00 |
| General miscellaneous | 2,406.71 | 3,234.00 |
| Timber-berth rentals, bonus, and fees | 24,034.30 | 21,684.00 |
| Interest on timber-berth rentals | 312.39 | 202.00 |
| Transfer fees on timber berths | 91.03 | 67.00 |
| Grazing fees and interest | 24,083.69 | 14,390.00 |
| | $3,257,525.05 | $2,720,867.00 |
| Taxation, Crown-grant timber lands | 269,285.54 | 349,439.00 |
| Total revenue from forest resources | $3,526,810.59 | $3,070,306.00 |

## FOREST EXPENDITURE, FISCAL YEAR 1937–38.

| Forest District. | Salaries. | Temporary Assistance. | Expenses. | Total. |
|---|---|---|---|---|
| Vancouver | $58,581.18 | $296.83 | $50,099.86 | $108,977.87 |
| Prince Rupert | 23,354.22 | ..... | 12,393.94 | 35,748.16 |
| Fort George | 21,171.18 | ..... | 5,287.54 | 26,458.72 |
| Kamloops | 41,310.70 | ..... | 17,506.58 | 58,817.28 |
| Nelson | 30,577.81 | 390.00 | 10,893.93 | 41,861.74 |
| Victoria | 69,245.11 | 125.35 | 12,666.68 | 82,037.14 |
| Totals | $244,240.20 | $812.18 | $108,848.53 | $353,900.91 |
| Lumber-trade Extension | | | | 50,000.00 |
| Canadian Forestry Association | | | | 4,000.00 |
| Reconnaissance | | | | 4,963.29 |
| Forest research | | | | 13,331.22 |
| Reforestation | | | | 12,700.35 |
| Grazing-range improvements* | | | | 4,811.28 |
| Forest Protection Fund* | | | | 400,000.00 |
| Forest Reserve Account* | | | | 51,574.29 |
| Grand total | | | | $895,281.34 |

* Contributions to special funds detailed elsewhere.

## AMOUNTS CHARGED, 1938.

| | Royalty. | Tax. | Penalty. | Seizure Expenses. | Government Scale. | | Scaling Fund. | | Stumpage. | Rentals, Cruising, Advertising, and Transfer Fees. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Scaling Expenses. | Scaling Fees. | Scaling Expenses. | Scaling Fees. | | | |
| Vancouver | $1,216,787.01 | $27,608.94 | $7,269.60 | $483.19 | $119.24 | $449.95 | $27,898.22 | $105,184.93 | $248,809.71 | $13,355.56 | $1,647,966.35 |
| Prince Rupert | 99,559.55 | 10,657.67 | 1,536.78 | 17.50 | 33.50 | 71.27 | 221.76 | 5,391.51 | 60,753.01 | 9,545.79 | 187,788.34 |
| Fort George | 55,503.01 | 667.60 | 484.97 | 41.50 | 6.90 | ..... | ..... | ..... | 56,528.10 | 3,499.56 | 116,731.64 |
| Kamloops | 81,272.67 | 29,348.67 | 1,244.98 | 31.66 | 27.00 | ..... | ..... | ..... | 105,750.87 | 7,869.24 | 225,545.09 |
| Nelson | 95,365.39 | 2,110.27 | 813.62 | 65.00 | 65.10 | ..... | ..... | ..... | 61,264.91 | 4,486.15 | 164,170.44 |
| Totals, 1938 | $1,548,487.63 | $70,393.15 | $11,349.95 | $638.85 | $251.74 | $521.22 | $28,119.98 | $110,576.44 | $533,106.60 | $38,756.30 | $2,342,201.86 |
| Totals, 1937 | $1,906,740.31 | $64,478.43 | $18,298.31 | $337.74 | $79.07 | $228.35 | $26,481.94 | $121,365.53 | $552,703.92 | $34,408.99 | $2,725,122.59 |
| Totals, 1936 | $1,872,454.02 | $38,014.76 | $4,205.73 | $948.46 | $80.87 | $337.03 | $25,463.31 | $139,706.30 | $414,580.44 | $27,575.11 | $2,523,366.03 |
| Totals, 1935 | $1,566,597.84 | $38,724.07 | $5,940.50 | $213.94 | $58.76 | $231.87 | $21,314.46 | $124,425.21 | $307,381.16 | $26,046.82 | $2,090,934.63 |
| Totals, 1934 | $1,192,539.15 | $45,429.55 | $7,382.38 | $251.70 | $106.36 | $183.89 | $17,436.57 | $99,563.66 | $287,608.81 | $33,028.34 | $1,683,530.41 |
| Totals, 1933 | $840,305.19 | $78,357.84 | $2,866.76 | $197.93 | $112.94 | $200.66 | $13,570.34 | $82,212.92 | $213,625.21 | $7,740.41 | $1,239,190.20 |
| Totals, 1932 | $907,238.48 | $139,350.44 | $3,983.03 | $368.73 | $56.66 | $225.73 | $13,368.44 | $71,596.21 | $280,036.64 | $26,444.83 | $1,442,669.19 |
| Ten-year average, 1929–38 | $1,393,234.57 | $81,995.06 | $6,996.87 | $710.95 | $110.50 | $550.14 | $20,597.11 | $105,755.88 | $422,407.44 | $30,750.87 | $2,063,109.39 |

## SCALING FUND.

| Fiscal Year. | Scaling Fee per M. | Collections. | Expenditure. | Balance. |
|---|---|---|---|---|
| 1920–21 | 5c. (1-4-20)<br>10c. (1-6-20) | $94,104.64 | $102,351.10 | Dr. $8,246.46 |
| 1921–22 | | 122,320.02 | 89,837.94 | Cr. 24,235.62 |
| 1922–23 | 6c. (1-4-22) | 123,011.53 | 122,963.11 | Cr. 24,284.04 |
| 1923–24 | | 125,315.72 | 141,386.29 | Cr. 8,213.47 |
| 1924–25 | | 125,182.71 | 153,550.57 | Dr. 20,154.39 |
| 1925–26 | | 139,586.67 | 146,958.97 | Dr. 27,526.69 |
| 1926–27 | | 130,797.95 | 140,289.37 | Dr. 37,018.11 |
| 1927–28 | | 135,477.44 | 139,242.26 | Dr. 40,782.93 |
| 1928–29 | | 139,980.62 | 147,601.87 | Dr. 48,404.18 |
| 1929–30 | | 134,480.55 | 142,359.06 | Dr. 56,282.69 |
| 1930–31 | | 118,993.68 | 128,359.26 | Dr. 65,648.27 |
| 1931–32 | | 100,537.57 | 110.417.94 | Dr. 75,528.64 |
| 1932–33 | | 80,177.96 | 78,691.02 | Dr. 74,041.70 |
| 1933–34 | | 104,180.89 | 92,428.15 | Dr. 62,288.96 |
| 1934–35 | | 111,824.68 | 101,008.69 | Dr. 51,472.97 |
| 1935–36 | | 151,351.08 | 120,307.65 | Dr. 20,429.54 |
| 1936–37 | 5c. (1-1-37) | 159,791.42 | 131,363.54 | Cr. 7,998.34 |

| | |
|---|---|
| Balance, April 1st, 1937 | $7,998.34 |
| Collections, fiscal year 1937–38 (fee, 5c. M.) | 149,686.12 |
| | $157,684.46 |
| Expenditures, fiscal year 1937–38 | 152,106.87 |
| Balance, March 31st, 1938 (credit) | $5,577.59 |

| | |
|---|---|
| Balance, April 1st, 1938 | $5,577.59 |
| Collections, 9 months, April–December, 1938 (fee, 5c. M.) | 117,544.45 |
| | $123,122.04 |
| Expenditures | 117,871.36 |
| Balance, December 31st, 1938 (credit) | $5,250.68 |

## FOREST RESERVE ACCOUNT.

| | |
|---|---|
| Balance brought forward, April 1st, 1937 | $14,101.49 |
| Amount received from Treasury, April 1st, 1937 | 67,669.16 |
| | $81,770.65 |
| Expenditures, fiscal year 1937–38 | 51,574.29 |
| Balance (credit), March 31st, 1938 | $30,196.36 |
| Amount received from Treasury, April 1st, 1938, (under subsection (2), section 32) | 74,907.62 |
| | $105,103.98 |
| Moneys received under subsection (4), section 32 | |
| Expenditures, 9 months to December 31st, 1938 | 55,051.53 |
| Balance (credit), December 31st, 1938 | $50,052.45 |

## GRAZING RANGE IMPROVEMENT FUND.

| Fiscal Year. | Government Contribution (⅓ of Collections). | Other Receipts. | Total Receipts. | Expenditure. | Balance. |
|---|---|---|---|---|---|
| 1920–21 | $3,398.00 | | $3,398.00 | | $3,398.00 |
| 1921–22 | 5,314.89 | | 5,314.89 | $5,564.72 | 3,148.17 |
| 1922–23 | 3,602.38 | | 3,602.38 | 1,582.04 | 5,168.51 |
| 1923–24 | 2,949.00 | $61.51 | 3,010.51 | 7,231.35 | 946.67 |
| 1924–25 | 4,910.94 | 22,79 | 9,933.73 | 9,292.54 | 1,588.86 |
| Destruction of wild horses | 5,000.00 | | | | |
| 1925–26 | 4,407.80 | 459.35 | 4,867.15 | 5,872.31 | 583.70 |
| 1926–27 | 4,679.82 | | 9,679.82 | 6,149.89 | 4,113.63 |
| Destruction of wild horses | 5,000.00 | | | | |
| 1927–28 | 4,923.72 | | 4,923.72 | 7,892.19 | 1,145.16 |
| 1928–29 | 4,904.08 | | 4,904.08 | 6,041.91 | 7.33 |
| 1929–30 | 4,187.18 | | 6,687.18 | 3,907.74 | 67.20 |
| Destruction of wild horses | 2,500.00 | | | | |
| 1930–31 | 4,578.64 | 9.00 | 7,087.64 | 6,047.64 | 3,826.77 |
| Destruction of wild horses | 2,500.00 | | | | |
| 1931–32 | Part only 4,000.00 and balance | 221.50 | 4,221.50 | 4,500.44 | 3,547.83 |
| 1932–33 | 5,211.64 | 36.35 | 5,250.99 | 2,445.62 | 6,353.20 |
| 1933–34 | 5,004.43 | 8.50 | 5,012.93 | 2,145.34 | 9,220.79 |
| 1934–35 | 3,324.17 | 6.50 | 3,330.67 | 1,202.78 | 11,348.68 |
| 1935–36 | 3,818.10 | 23.75 | 3,841.85 | 1,651.58 | 13,538.95 |
| 1936–37 | 4,356.36 | 110.00 | 4,466.36 | 4,669.73 | 13,335.58 |
| 1937–38 | 4,811.28 | 255.00 | 5,066.28 | 8,069.07 | 10,332.79 |
| | $93,382.43 | $1,217.25 | $94,599.68 | $84,266.89 | $10,332.79 |

April 1st, 1938—

| | |
|---|---|
| Balance (credit) | $10,332.79 |
| Collections, April 1st to December 31st, 1938 | 7,518.07 |
| | $17,850.86 |
| Expenditure, April 1st to December 31st, 1938 | 3,150.35 |
| Balance (credit), December 31st, 1938 | $14,700.51 |

## STANDING OF FOREST PROTECTION FUND, DECEMBER 31st, 1938.

| | | |
|---|---|---|
| Balance (deficit), April 1st, 1937 | | $181,936.97 |
| Expenditure | | 464,899.18 |
| | | $646,836.15 |
| Collections, tax | $145,331.44 | |
| Collections, miscellaneous | 38,911.93 | |
| Government contribution | 400,000.00 | |
| | | $584,243.37 |
| Balance (deficit), March 31st, 1938 | | $62,592.78 |
| Balance (deficit), April 1st, 1938 | | $62,592.78 |
| Expenditure, 9 months, April–December, 1938 | | 753,225.79 |
| | | $815,818.57 |
| Collections, tax | $150,635.90 | |
| Collections, miscellaneous | 6,813.08 | |
| Government contributions | 330,000.00 | |
| | | 487,448.98 |
| Balance (deficit), December 31st, 1938 | | $328,369.59 |

ESTIMATED AND KNOWN COSTS OF FOREST PROTECTION TO OTHER AGENCIES, 1938.

| Forest District. | EXPENDITURES. | | | | |
|---|---|---|---|---|---|
| | Tools and Equipment. | Improvements. | Patrol. | Fire-fighting. | Total. |
| Vancouver | $61,908.00 | $600.00 | $63,478.00 | $377,019.00 | $503,005.00 |
| Prince Rupert | 50.00 | ..... | ..... | 1,291.00 | 1,341.00 |
| Fort George | ..... | ..... | ..... | 1,538.00 | 1,538.00 |
| Kamloops | 906.00 | ..... | ..... | 10,772.00 | 11,678.00 |
| Nelson | 12,325.00 | ..... | 2,199.00 | 10,802.00 | 25,326.00 |
| Totals | $75,189.00 | $600.00 | $65,677.00 | $401,422.00 | $542,888.00 |
| Totals, 1937 | 79,531.00 | 4,245.00 | 64,796.00 | 24,474.00 | 173,046.00 |

EXPENDITURE FOR TWELVE MONTHS ENDED MARCH 31ST, 1938.

| Districts. | Patrols and Fire Prevention. | Tools and Equipment. | Fires. | Improvements. | Total. |
|---|---|---|---|---|---|
| Vancouver | $104,786.04 | $19,216.26 | $5,695.95 | $5,959.08 | $135,657.33 |
| Prince Rupert | 21,521.03 | 3,623.91 | 2,501.25 | 607.26 | 28,253.45 |
| Prince George | 22,630.18 | 12,815.64 | 2,097.13 | 583.62 | 38,126.57 |
| Kamloops | 57,110.79 | 21,608.83 | 2,906.23 | 2,350.03 | 83,975.88 |
| Nelson | 64,121.40 | 26,927.22 | 15,155.31 | 1,757.58 | 107,961.51 |
| Victoria | 54,256.68* | 16,667.76 | ..... | ..... | 70,924.44 |
| Totals | $324,426.12 | $100,859.62 | $28,355.87 | $11,257.57 | $464,899.18 |

* This includes purchase and maintenance of trucks, tractors, etc., for use by Forest Development Projects, and a total of $30,474.91 for rent of same was refunded to Forest Protection Fund.

## FOREST PROTECTION.

Mention has been made in former reports of the cyclical behaviour of fire weather wherein the fluctuations from good to bad fire-years and back again were noted. The change is usually not so sudden as between 1937—one of the most favourable seasons on record—and 1938, one of the worst. The prediction of 1937: that before long we must expect change from a series of good years, was borne out emphatically in 1938. The number of fires jumped from 1,193 in 1937 to 2,412 in 1938; damage rose from $155,000 to $2,231,000; and costs of fighting fires went from $28,000 to $500,000.

The reasons for this were plain in the weather records. In the Vancouver District, the hardest hit of all, practically no rain fell from early May until September 6th, during which time high drying winds and low fuel moisture prevailed for considerable periods. In this district the fire season developed from May 18th. A stretch of hot dry weather was responsible for forty-eight fires in the ensuing week. This hazardous condition was only broken by short periods of favourable weather and culminated in an extremely serious situation, beginning July 13th with no let-up until August 8th. In this twenty-seven-day period 178 fires occurred, many of major proportions; examples being Sechelt, 5,500 acres; Lund, 4,500 acres; Pender Harbour, 3,700 acres; Mission, 2,900 acres; and Powell River, 2,600 acres. During this period many fires which had originated earlier escaped control, the most serious being the fire at Campbell River, which started July 7th and ultimately covered nearly 75,000 acres and on which over $250,000 was expended by the various agencies.

Hazardous weather again occurred during the last ten days of August, when two major fires occurred; one at Cowichan Lake of 3,600 acres and another at Lund of 3,400 acres. This period was followed by favourable weather until September 14th, when a three-day hazard was responsible for twelve fires, including a 3,500-acre fire at Port Alberni, following which the fire season ended.

Elsewhere in the Province similar conditions occurred; while notably in the Nelson District over one hundred lightning fires were set on September 1st. In the northern part of the Province early spring hazard was not alleviated to any great extent during mid-summer and

large, uncontrolled fires burned until late in the fall in the Peace and Findlay River regions —fires that did damage unknown because of their remote location and lack of staff to report.

The protection staff of 263 in 1938, including the permanent force of Rangers, is not yet up to the standard of 1931 of 322 men, even then considered inadequate. Those areas more difficult of access at present—but the future source of much of our forest wealth—must be given adequate protection if this Province is to continue to make full use of the productive capacity of all its forest land.

The only answer to lack of sufficient staff is to endeavour to increase the efficiency of the existing force. This has been done through better equipment, improved methods, and closer contact between supervisory and field officers. Co-operation has been maintained with other forest services, notably that of the United States, with the object of sharing ideas on all lines of forest-protection.

Prevention of forest fires, the first line of defence, has two main lines of approach: First, the prevention of fires escaping from legitimate industrial and private use; and, second, the prevention of accidental fires from unnecessary, careless, or illegal use.

The industrial use of fire in engines, waste destroyers, and in clearing land is controlled, through the " Forest Act," by power to refuse permits to operate unless all requirements are met. An increase in inspection efficiency was made in 1938 and regulations more carefully enforced. As a result fires from these sources were very considerably less than in the last bad fire year.

The only avenue of approach to the prevention of careless fires is through public and private contact. Our educational work continued in 1938 and several new avenues were tried, notably sound moving-picture trailers in theatres and short broadcast announcements over practically all radio circuits. Several new motion pictures were made and have been shown extensively throughout the Province; newspaper and magazine space was used through advertisements and articles. Many firms carried a forest-protection message on letters and accounts; merchandise labels likewise bore a slogan; several large department stores were assisted in decorating a window with suitable material; upwards of 100,000 stuffers were distributed through photo-finishing studios; and, finally, 19,000 people—children and adults —at over 190 meetings were reached through talks, some accompanied by motion pictures.

In spite of all preventive efforts fires continue to occur, and when hazard conditions become acute it is necessary to take drastic steps to prevent them. Under the authority of the " Forest Act " certain areas of particularly high hazard are closed each fire season to travel without permit. This enables the forest officers to control such travel when the situation eases and to stop it entirely when the hazard is acute. In 1938 the following closures were effective:—

| Area. | Dates. | |
|---|---|---|
| Alouette | April 25th | Lifted Sept. 8th. |
| Great Central | June 16th | |
| Campbell River | June 25th | |
| Gordon Pasha Lakes | July 21st | |
| Nanaimo Area | July 22nd | |
| Theodosia River | July 22nd | |
| Jordan River | July 22nd | |
| Alexander Creek | June 10th | Lifted Sept. 12th. |
| Moyie River | June 10th | |
| Sheep Creek | July 6th | |
| Copper Mountain | August 3rd | |

The results of these closures have been generally effective and it is felt many fires have thereby been prevented in most hazardous times and places. The restrictions were generally accepted by the public as necessary and with little complaint.

A primary objective in protection is to secure, with the least delay, reports of fires starting. In British Columbia there have been established fifty lookout points on which men are constantly on the watch for fires during hazardous weather. These points have been chosen to cover areas of high hazard not seen by any other agency capable of reporting fires. The number is still very inadequate, but every effort to increase their efficiency is being made. Notably, a new method of locating fires by panoramic photographs has been developed and

twenty-five lookouts were equipped for their use in 1938. This project should be brought to completion in 1939.

Prior to the development of reliable radio sets it was necessary to connect lookout stations and headquarters by telephone-line. Even the cheapest form of construction cost about $150 per mile, with few stations requiring less than 5 miles of line. Reliable two-way radio has now been developed which can be bought for less than the cost of 2 miles of line. By its use the cost of establishing lookouts has been reduced materially and temporary lookout points may now be manned at a reasonable cost. The sets are portable and have also been used to great advantage by patrolmen and especially on large fires. Established at the fire camp or right on the line they enable the officers on the job to keep in touch with headquarters for the movement of men and supplies as dictated by the situation, without the delay formerly caused through having to send out foot-messengers. Forty such sets were bought in 1938.

The Youth Forestry Training Plan was continued in co-operation with the Department of Labour and the Dominion Government. This plan, reported on more fully elsewhere, has become a highly important and valuable aid in the protection of British Columbia's forest wealth, and through the training given the young men by forest officers is continuing to develop individuals who qualify as forest officers and a large body of citizens aware of and trained to the needs of forest protection. The continuation of this scheme is highly important to the protection of British Columbia's multiple-use forests.

The large-scale logging operations in the Lower Coast region creates each year upwards of 40,000 acres of cut-over land. One immediate result of these operations is the creation of slash (brush and debris) which becomes highly inflammable in the fire season and a very definite hazard. On January 1st, 1938, section 113A of the "Forest Act" came into force, designed to make obligatory the disposal of slash considered a hazard by the Forest Service, and setting penalties for non-disposal. This had been found necessary because of the failure of existing legislation to accomplish the desired purpose.

During the year two special experienced officers were attached to the Vancouver Forest District to assist and advise operators in the disposal of their slash. They handled some of the large and difficult cases and advised with the regular field staff who continued to deal with the others. The result of this increased emphasis on hazard-reduction was a total area burned under control of approximately 50,000 acres, which included a large acreage of slash more than a year old. Compared with 27,000 acres burned in 1927 and a ten-year average to 1927 of 8,000 acres, the results are most encouraging. With the continued co-operation of the logging industry slash-hazards should never again get beyond a current basis.

Research was continued into the behaviour of fires under varying conditions, the effect of weather on fire occurrence and action, the forecasting of fire weather, the proper location of lookouts and testing the efficiency of lookout-men. Progress has been made along these lines and will be continued in 1939.

Savings made during the favourable years before 1938 made possible a reduction in the Forest Protection Fund deficit from $345,813.82 on April 1st, 1933, to $62,592.78 on April 1st, 1938. At the same time the organization was built up towards what it was in 1931 and considerable sums were expended on badly-needed equipment and improvements.

The year 1938, however, was so severe that the Forest Protection Fund provided was not nearly adequate to the drain for fire-fighting. Despite rigid economy and neglect of inaccessible fires, the net result of the fire season was an increase in the Fund deficit to $328,369.59, as at December 31st, 1938. This will be reduced by the end of the fiscal year, March 31st, 1939, by further Government contributions of $70,000. The total cost of fire-fighting of approximately $500,000 was responsible for this condition.

Over the past twenty years it is found that 51 per cent. of the costs, 51 per cent. of the area burned, and 47 per cent. of the total damage occurred in the five worst years. Although the other years showed some costs and damage they were kept well within an allowable maximum. It is quite apparent, therefore, that a forest-protection organization, to be effective, must be developed to cope with the bad years. This means closer control of fire-hazards through existing legislation, broader educational and public relations work, greatly increased numbers and efficiency of lookouts and other field staff, and adequate research and supervisory force. Forest protection is the most complicated and exacting of all forest activities. It calls for the keenest, most alert, and best-trained personnel, without whom this great asset of the

Province may be ruined. The burden, at present, is too heavy for the staff to handle with full efficiency and secure the time so necessary for planning, training, and development.

The size of the problem is indicated in the detailed statistics of the fire season given in the following tables:—

### Fire Occurrences by Months, 1938.

| Forest District. | April. | May. | June. | July. | Aug. | Sept. | Oct. | Total. |
|---|---|---|---|---|---|---|---|---|
| Vancouver | 5 | 74 | 154 | 195 | 126 | 108 | 2 | 664 |
| Prince Rupert | 7* | 36 | 24 | 30 | 26 | 27 | 1 | 151 |
| Fort George | 10 | 92 | 58 | 55 | 60 | 59 | ---- | 334 |
| Kamloops | 35† | 99 | 165 | 185 | 145 | 73 | 1 | 703 |
| Nelson | 7 | 28 | 66 | 122 | 175 | 161 | 1 | 560 |
| Totals | 64 | 329 | 467 | 587 | 532 | 428 | 5 | 2,412 |
| Ten-year average, 1929–38 | 79 | 221 | 233 | 462 | 516 | 197 | 16 | 1,717 |

* One in February. † One in March.

### Number and Causes of Fires in Province, 1938.

| Forest District. | Lightning. | Campers. | Railways Operating. | Smokers. | Brush-burning (not Railway-clearing). | Road and Power- and Telephone-line Construction. | Industrial Operations. | Incendiarism. | Miscellaneous (Known Causes). | Unknown Causes. | Total. | Per Cent. of Total Fires in Province. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vancouver | 86 | 131 | 25 | 215 | 37 | ---- | 59 | 65 | 39 | 7 | 664 | 27.53 |
| Prince Rupert | 18 | 45 | 7 | 37 | 18 | ---- | 1 | 9 | 16 | ---- | 151 | 6.26 |
| Fort George | 94 | 79 | 6 | 25 | 75 | 2 | 7 | 14 | 6 | 26 | 334 | 13.84 |
| Kamloops | 227 | 126 | 9 | 129 | 33 | 1 | 6 | 18 | 139 | 15 | 703 | 29.15 |
| Nelson | 278 | 61 | 25 | 118 | 17 | 1 | 3 | 15 | 38 | 4 | 560 | 23.22 |
| Totals | 703 | 442 | 72 | 524 | 180 | 4 | 77 | 121 | 238 | 51 | 2,412 | 100.00 |
| Per cent. | 29.15 | 18.33 | 2.99 | 21.73 | 7.46 | 0.16 | 3.15 | 5.01 | 9.86 | 2.16 | 100.00 | ------- |
| Ten-year average, 1929–38 | 460 | 313 | 133 | 330 | 137 | 16 | 45 | 130 | 121 | 27 | 1,717 | ------- |

### Damage to Property other than Forests, 1938.

| Forest District. | Forest Products in Process of Manufacture. | Buildings. | Railway and Logging Equipment. | Miscellaneous. | Total. | Per Cent. of Total. |
|---|---|---|---|---|---|---|
| Vancouver | $409,358.00 | $85,476.00 | $145,854.00 | $19,111.00 | $659,799.00 | 97.75 |
| Prince Rupert | 81.00 | 470.00 | ---------- | 250.00 | 801.00 | .08 |
| Fort George | 396.00 | ---------- | ---------- | 406.00 | 802.00 | .12 |
| Kamloops | 3,966.00 | 2,795.00 | 21.00 | 4,606.00 | 11,388.00 | 1.69 |
| Nelson | 972.00 | 70.00 | 24.00 | 1,310.00 | 2,376.00 | .36 |
| Totals | $414,773.00 | $88,811.00 | $145,899.00 | $25,683.00 | $675,166.00 | 100.00 |
| Ten-year average, 1929–38 | $101,707.00 | $45,313.00 | $66,851.00 | $14,270.00 | $288,042.00 | ------- |

FIRES CLASSIFIED BY PLACE OF ORIGIN AND COST OF FIRE-FIGHTING, 1938.

| Forest District. | Total Fires. | Originated on vacant Crown Land and Lands paying F.P. Tax. | Originated on Lands not paying F.P. Tax. | Extinguished without Cost. | | | Cost Money to extinguish. | | | | | | | | Total Forest Service Costs in fighting Fire. | | Average Cost per Fire. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Number. | Per Cent. of Total Fires in District. | Per Cent. of Total Fires in Province. | Number. | Per Cent. of Total Fires in District. | Per Cent. of Total Fires in Province. | Cost less than $100. | Cost $100 to $1,000. | Cost $1,000 to $5,000. | Cost $5,000 to $10,000. | Cost over $10,000. | Dollars. | Per Cent. of Total spent in fighting Fires in Province. | Dollars. |
| Vancouver | 664 | 193 | 471 | 234 | 35.24 | 9.70 | 430 | 64.76 | 17.83 | 293 | 103 | 24 | 5 | 5 | 291,822.21 | 59.56 | 439.50 |
| Prince Rupert | 151 | 52 | 99 | 79 | 52.32 | 3.28 | 72 | 47.68 | 2.98 | 47 | 22 | 3 | ..... | ..... | 17,182.14 | 3.51 | 113.85 |
| Fort George | 334 | 233 | 101 | 183 | 54.79 | 7.59 | 151 | 45.21 | 6.26 | 117 | 31 | 3 | ..... | ..... | 17,890.15 | 3.65 | 53.56 |
| Kamloops | 703 | 467 | 236 | 344 | 48.93 | 14.26 | 359 | 51.07 | 14.88 | 282 | 63 | 10 | 4 | ..... | 82,029.41 | 16.74 | 116.70 |
| Nelson | 560 | 499 | 61 | 166 | 29.64 | 6.88 | 394 | 70.36 | 16.34 | 308 | 66 | 17 | 3 | ..... | 80,989.53 | 16.54 | 144.62 |
| Totals | 2,412 | 1,444 | 968 | 1,006 | ..... | 41.71 | 1,406 | —— | 58.29 | 1,047 | 285 | 57 | 12 | 5 | 489,913.44* | 100.00 | 203.11 |
| Per cent | 100.00 | 59.87 | 40.13 | 41.71 | ..... | ..... | 58.29 | ..... | ..... | 43.41 | 11.82 | 2.36 | 0.49 | 0.20 | ..... | ..... | ..... |
| Ten-year average, 1929–38 | 1,717 | 1,002 | 715 | 860 | ..... | ..... | 856 | ..... | ..... | 638 | 170 | 39 | 5 | 3 | 218,835.25* | ..... | 104.60 |

Cost to other parties (413 cost fires), $401,422.00; cost to Forest Branch (1,406 cost fires), $489,913.44.

* Cost correct to date. Subject to later revision.

Detailed final costs are published one year in arrears in the table of "Expenditure by Districts" in each annual report.

## Number and Causes of Forest Fires for the Last Ten Years.

| Causes. | 1938. | 1937. | 1936. | 1935. | 1934. | 1933. | 1932. | 1931. | 1930. | 1929. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lightning | 703 | 263 | 524 | 173 | 320 | 285 | 336 | 457 | 892 | 638 | 4,609 |
| Campers | 442 | 269 | 256 | 217 | 312 | 234 | 230 | 470 | 344 | 358 | 3,132 |
| Railways operating | 72 | 74 | 81 | 65 | 103 | 77 | 156 | 295 | 149 | 267 | 1,339 |
| Railways under construction | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 9 | 9 |
| Smokers | 524 | 242 | 321 | 289 | 415 | 197 | 197 | 435 | 294 | 387 | 3,301 |
| Brush-burning (not railway-clearing) | 180 | 107 | 78 | 127 | 117 | 77 | 108 | 243 | 171 | 167 | 1,375 |
| Road and power- and telephone line construction | 4 | 14 | 6 | 11 | 10 | 7 | 18 | 44 | 29 | 22 | 165 |
| Industrial operations | 77 | 55 | 29 | 45 | 41 | 32 | 17 | 57 | 39 | 65 | 457 |
| Incendiarism | 121 | 20 | 74 | 72 | 65 | 65 | 127 | 355 | 262 | 139 | 1,300 |
| Miscellaneous (known causes) | 238 | 124 | 152 | 97 | 188 | 90 | 64 | 96 | 68 | 100 | 1,217 |
| Unknown causes | 51 | 25 | 26 | 15 | 19 | 18 | 13 | 48 | 23 | 36 | 274 |
| Totals | 2,412 | 1,193 | 1,547 | 1,111 | 1,590 | 1,082 | 1,266 | 2,518 | 2,271 | 2,188 | 17,178 |

## Fires classified by Size and Damage, 1938.

| Forest District. | Total Fires. | | Under ¼ Acre. | | | ¼ to 10 Acres. | | | Over 10 Acres in Extent. | | | Damage. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number. | Per Cent. of Total Fires in Province. | Number. | Per Cent. of Total Fires in District. | Per Cent. of Total Fires in this Class. | Number. | Per Cent. of Total Fires in District. | Per Cent. of Total Fires in this Class. | Number. | Per Cent. of Total Fires in District. | Per Cent. of Total Fires in this Class. | Under $100. | Between $100 and $1,000. | Over $1,000. |
| Vancouver | 664 | 27.53 | 256 | 38.56 | 24.27 | 266 | 40.06 | 33.88 | 142 | 21.38 | 24.83 | 576 | 47 | 41 |
| Prince Rupert | 151 | 6.26 | 70 | 46.36 | 6.63 | 43 | 28.48 | 5.48 | 38 | 25.16 | 6.64 | 130 | 15 | 6 |
| Fort George | 334 | 13.85 | 123 | 36.83 | 11.66 | 115 | 34.43 | 14.65 | 96 | 28.74 | 16.79 | 285 | 27 | 22 |
| Kamloops | 703 | 29.14 | 263 | 37.41 | 24.93 | 209 | 29.73 | 26.63 | 231 | 32.86 | 40.38 | 592 | 73 | 38 |
| Nelson | 560 | 23.22 | 343 | 61.25 | 32.51 | 152 | 27.14 | 19.36 | 65 | 11.61 | 11.36 | 511 | 31 | 18 |
| Totals | 2,412 | 100.00 | 1,055 | ..... | 100.00 | 785 | ..... | 100.00 | 572 | ..... | 100.00 | 2,094 | 193 | 125 |
| Per cent. | 100.00 | ..... | 43.74 | ..... | ..... | 32.55 | ..... | ..... | 23.71 | ..... | ..... | 86.81 | 8.00 | 5.19 |
| Ten-year average, 1929–38 | 1,717 | ..... | 734 | ..... | ..... | 588 | ..... | ..... | 395 | ..... | ..... | 1,537 | 357 | 64 |

## Causes, Cost, and Damage, 1938.

| Causes. | No. | Per Cent. | Cost. | Per Cent. | Damage. | Per Cent. |
|---|---|---|---|---|---|---|
| Lightning | 703 | 29.15 | $91,906.77 | 18.76 | $262,447.06 | 11.76 |
| Campers | 442 | 18.33 | 68,999.67 | 14.07 | 268,743.94 | 12.04 |
| Railways operating | 72 | 2.99 | 6,240.28 | 1.27 | 42,566.44 | 1.91 |
| Smokers | 524 | 21.73 | 58,225.95 | 11.90 | 124,945.77 | 5.60 |
| Brush-burning (not railway-clearing) | 180 | 7.46 | 5,504.05 | 1.13 | 30,880.92 | 1.39 |
| Road, power, telephone, and telegraph | 4 | 0.16 | ..... | ..... | 20.00 | ..... |
| Industrial operations | 77 | 3.15 | 170,492.46 | 34.83 | 1,122,241.21 | 50.30 |
| Incendiarism | 121 | 5.01 | 59,173.91 | 12.07 | 199,856.32 | 8.96 |
| Miscellaneous (known causes) | 238 | 9.86 | 17,921.15 | 3.64 | 32,918.91 | 1.48 |
| Unknown causes | 51 | 2.16 | 11,449.20 | 2.33 | 146,394.43 | 6.56 |
| | 2,412 | 100.00 | $489,913.44 | 100.00 | $2,231,015.00 | 100.00 |

## PROSECUTIONS FOR FIRE TRESPASS, 1938.

| Forest District. | Information laid. | Contravention of Section 99 of "Forest Act." | Contravention of Section 100 of "Forest Act." | Contravention of Section 104 of "Forest Act." | Contravention of Section 116 of "Forest Act." | Contravention of Section 118 of "Forest Act." | Contravention of Section 119 of "Forest Act." | Contravention of Section 122 of "Forest Act." | Burning without Permit. | Fines. | | Served sentence in Gaol. | Suspened Sentence. | Cases dismissed. | Cases pending. | Cases withdrawn. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | No. | Amount. | | | | | |
| Vancouver | 24 | 1 | — | 4 | — | 3 | 5 | 1 | 10 | 17 | $450.00 | — | 4 | 3 | — | — |
| Prince Rupert | 4 | — | — | — | — | — | — | — | 4 | 1 | 25.00 | 1 | 2 | — | — | — |
| Fort George | 14 | — | 2 | — | — | 3 | — | — | 9 | 2 | 50.00 | 5 | 5 | 2 | — | — |
| Kamloops | 11 | — | 1 | — | 4 | — | — | — | 6 | 3 | 75.00 | 6 | 2 | — | — | — |
| Nelson | 8 | — | 2 | — | — | — | — | — | 6 | 2 | 50.00 | 4 | 2 | — | — | — |
| Total | 61 | 1 | 5 | 4 | 4 | 6 | 5 | 1 | 35 | 25 | $650.00 | 16 | 15 | 5 | — | — |
| Ten-year average, 1929–38 | 25 | — | — | — | — | — | — | — | — | 12 | $354.00 | — | — | — | — | — |

## Damage caused by Forest Fires, 1938, Part I.

| Forest District. | Merchantable Timber. | | | | Immature Timber. | | Not satisfactorily stocked. | | | | Non-commercial Cover. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Net Area killed. | Volume killed. | Volume salvable. | Net Stumpage Loss. | Net Area killed. | Present Value. | Logged. | Logged and burned. | Burned. | Damage. | Area burned. | Damage. |
| | Acres. | M. Ft. B.M. | M. Ft. B.M. | $ | Acres. | $ | Acres. | Acres. | Acres. | $ | Acres. | $ |
| Vancouver | 24,689 | 531,183 | 395,722 | 427,774 | 35,169 | 289,494 | 35,071 | 50,479 | 3,276 | 44,413 | 35,022 | 16,139 |
| Prince Rupert | 4,308 | 39,925 | 173 | 6,308 | 4,403 | 10,147 | 170 | 61 | 11,713 | 5,972 | 8,888 | 4,444 |
| Fort George | 6,930 | 110,555 | 953 | 42,686 | 21,235 | 81,919 | 327 | 9,335 | 18,151 | 13,647 | 24,470 | 12,228 |
| Kamloops | 45,903 | 325,417 | 2,947 | 312,617 | 37,853 | 93,177 | 4,714 | 14,651 | 65,475 | 34,751 | 74,926 | 27,743 |
| Nelson | 10,555 | 40,461 | 732 | 30,004 | 15,270 | 47,328 | 758 | 1,988 | 15,414 | 9,022 | 19,386 | 9,469 |
| Totals | 92,385 | 1,047,541 | 400,527 | 819,389 | 113,930 | 522,065 | 41,040 | 76,514 | 114,029 | 107,805 | 162,692 | 70,023 |
| Per cent. | 12.97 | 100.00 | 38.23 | 52.66 | 16.05 | 33.56 | 5.75 | 10.75 | 16.02 | 6.93 | 22.84 | 4.50 |
| | 79,285 | 415,178 | 84,485 | 400,140 | 108,515 | 347,811 | ..... | ..... | ..... | ..... | ..... | ..... |

## Damage caused by Forest Fires, 1938, Part II.

| Forest District. | Grazing or Pasture Land. | | Non-productive Sites. | | Grand Totals. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Area. | | Quantity. | | Damage. | |
| | Area burned. | Damage. | Area burned. | Damage. | | | | | | |
| | Acres. | $ | Acres. | $ | Acres. | Per Cent. | M. Ft. B.M. | Per Cent. | $ | Per Cent. |
| Vancouver | 2,223 | 112 | 15,860 | 7,921 | 201,789 | 28.34 | 531,183 | 50.70 | 785,853 | 50.51 |
| Prince Rupert | 768 | 38 | 5,965 | 2,983 | 36,276 | 5.10 | 39,925 | 3.82 | 29,892 | 1.92 |
| Fort George | 2,117 | 106 | 8,290 | 4,140 | 90,855 | 12.77 | 110,555 | 10.56 | 154,726 | 9.94 |
| Kamloops | 35,654 | 1,759 | 19,637 | 9,804 | 298,813 | 41.98 | 325,417 | 31.06 | 479,851 | 30.85 |
| Nelson | 116 | 6 | 20,598 | 9,698 | 84,085 | 11.81 | 40,461 | 3.86 | 105,527 | 6.78 |
| Totals | 40,878 | 2,021 | 70,350 | 34,546 | 711,818 | 100.00 | 1,047,541 | 100.00 | 1,555,849 | 100.00 |
| Per cent. | 5.74 | 0.13 | 9.88 | 2.22 | 100.00 | ..... | 100.00 | ..... | 100.00 | ..... |
| Ten-year average, 1929–38 | 24,892 | 1,306 | ..... | ..... | 512,040 | ..... | 415,178 | ..... | 830,944 | ..... |

## Comparison of Damage caused by Forest Fires in Last Ten Years.

| | 1938. | 1937. | 1936. | 1935. | 1934 | 1933. | 1932. | 1931. | 1930. | 1929. | Total 10 Years. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total number of fires | 2,412 | 1,193 | 1,547 | 1,111 | 1,590 | 1,082 | 1,266 | 2,518 | 2,271 | 2,188 | 17,178 |
| Area burned (acres) | 711,818 | 54,843 | 433,902 | 47,871 | 638,690 | 301,486 | 421,297 | 994,979 | 602,675 | 909,620 | 5,117,182 |
| Standing timber destroyed or damaged (M. ft. B.M.) | 1,047,541 | 13,263 | 932,808 | 26,113 | 817,125 | 123,815 | 269,317 | 210,173 | 390,978 | 272,024 | 4,103,157 |
| Amount salvable (M. ft. B.M.) | 400,527 | 565 | 23,814 | 14,359 | 179,358 | 21,926 | 15,057 | 41,808 | 25,216 | 107,049 | 829,679 |
| Damage to forests | $1,555,849 | $36,384 | $1,109,473 | $68,399 | $888,607 | $308,964 | $514,664 | $1,477,181 | $1,408,183 | $941,738 | $8,309,442 |
| Damage to other forms of property | $675,166 | $119,380 | $66,189 | $221,144 | $104,877 | $146,758 | $57,030 | $326,305 | $337,909 | $226,919 | $2,281,677 |
| Total damage | $2,231,015 | $155,764 | $1,175,662 | $289,543 | $993,484 | $455,722 | $571,694 | $1,803,486 | $1,746,092 | $1,168,657 | $10,591,119 |

## Burning Permits, 1938.

| Forest District. | Clearing Agricultural Land. | | | | Clearing Logging-slash. | | | | Clearing Railway Right-of-way. | | | | Clearing Public Roads. | | | | Grand Totals. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Permits issued. | Area burned over. | Fires escaped Control. | Fires set without Permit. | Permits issued. | Area burned over. | Fires escaped Control. | Fires set without Permit. | Permits issued. | Area burned over. | Fires escaped Control. | Fires set without Permit. | Permits issued. | Area burned over. | Fires escaped Control. | Fires set without Permit. | Permits issued. | Area burned over. | Fires escaped Control. | Fires set without Permit. |
| | No. | Acres. | No. | No. | No. | Acres. | No. | No. | No. | Acres. | No. | No. | No. | Acres. | No. | No. | No. | Acres. | No. | No. |
| Vancouver | 2,647 | 10,258 | 15 | 9 | 170 | 21,638 | ..... | 1 | 19 | 5,400 | ..... | ..... | 43 | 143 | ..... | ..... | 2,879 | 37,439 | 15 | 10 |
| Prince Rupert | 827 | 2,312 | 7 | 4 | 33 | 68 | ..... | ..... | 33 | ..... | 5 | ..... | 55 | 1,072 | 1 | 1 | 948 | 3,452 | 13 | 5 |
| Fort George | 1,641 | 5,118 | 29 | 11 | 64 | 137 | 1 | ..... | 21 | 126 | 5 | ..... | 30 | 60 | 2 | ..... | 1,756 | 5,441 | 37 | 11 |
| Kamloops | 1,251 | 3,047 | 2 | 3 | 79 | 239 | ..... | ..... | 4 | 2 | 1 | ..... | 18 | 673 | ..... | ..... | 1,352 | 3,961 | 3 | 3 |
| Nelson | 1,511 | 2,538 | 17 | 4 | 4 | 7 | ..... | ..... | 24 | ..... | ..... | ..... | 8 | 30 | ..... | ..... | 1,547 | 2,575 | 17 | 4 |
| Totals | 7,877 | 23,273 | 70 | 31 | 350 | 22,089 | 1 | 1 | 101 | 5,528 | 11 | ..... | 154 | 1,978 | 3 | 1 | 8,482 | 52,868 | 85 | 33 |
| Per cent | 92.86 | 44.02 | 82.34 | 93.94 | 4.13 | 41.78 | 1.18 | 3.03 | 1.19 | 10.46 | 12.95 | ..... | 1.82 | 3.74 | 3.53 | 3.03 | 100.00 | 100.00 | 100.00 | 100.00 |
| Ten-year average, 1929–38 | 9,308 | 21,620 | 53 | 29 | 315 | 9,174 | 3 | 1 | 91 | 2,467 | 8 | ..... | 208 | 1,944 | 8 | 1 | 9,924 | 34,234 | 73 | 32 |

## GRAZING.

There was a fairly late spring in 1938 which depleted available hay-supplies and resulted in many herds going on the range in poor condition. As the summer progressed it developed into drought conditions that interfered materially with the growth of forage on the important open ranges and even cut short the growth in the higher, timbered summer-grazing areas. This condition was ameliorated by heavy rains in August, which had the immediate effect of stimulating forage-growth and thereby improved the condition of the stock. As the cattle were put into the feeding season they were generally in good shape.

Although there are, in places, considerable areas of summer range still available, it cannot be used economically without the corresponding spring and fall range. The latter is practically all being used and has been for some years. This unbalanced condition, with other factors, has led to the ranchers crowding too many cattle on the spring and fall grazing-grounds; while lack of sufficient winter feed has forced them to turn out too early. Over-grazing has been the result, with much destruction of valuable forage species, impoverishment of the soil and the remaining forage, with, ultimately, a poorer grade of stock produced at greater cost.

Range-management attempts to alter these conditions by prescribing turn-out dates and numbers according to the forage condition on each particular range; by planning rotations so that an ample amount of rest and seeding-time is given each range; by building drift-fences to protect the range from harmful grazing, and by developing trails and watering-places so that unused ranges may be utilized.

There are several million acres of Crown range in the Interior of the Province and more than 700 permittees using them. The proper management of these vast areas, involving the plans of so many individuals, is a problem of no small magnitude. It requires a knowledge of the location and capacity of the range, of the growth-habits and feed values of the forage plants, of the prevalence of harmful weeds, and of the seasonal handling of stock.

We are gradually building up a fund of information in the form of maps, reports, and tabulations showing the location and capacities of the various ranges. This is accomplished largely through the work of the Forester in charge of grazing at Kamloops and two assistants who covered an area of approximately 171,000 acres in 1938. Of this area 23,000 acres were sheep range not previously used. The balance was cattle and sheep range that has been used for some years but never before mapped.

Mapping of the range would be of little use without some knowledge of the forage value and growth-habits of the plants on it. Grazing officials are experienced botanists or agricultural graduates who have devoted considerable time to the study of range-forage. They also have the benefit of the research-work being done by the Dominion Range Experiment Station at Kamloops, which is concentrating on the practical aspects of the range and live-stock management on typical British Columbia range-lands. As definite knowledge is developed it will be applied to Crown ranges.

In the early summer of 1938 two grazing assistants from Kamloops were afforded the opportunity, at the invitation of the United States Forest Service, of attending an instructional course in intensive range reconnaissance of two weeks' duration. This course took a group of young men and gave them thorough instruction in the survey methods used, the botany of the range-forage, the estimating of carrying capacity, and the mapping and reporting of the results. Conducted by recognized experts and at no cost to the Province save travelling expenses to and from Montana, the results will undoubtedly be of value in the improvement of range management. The appreciation of the Department has been expressed to the United States Forest Service for their courtesy in this matter.

Our policy of co-operation with live-stock associations, especially those recognized under the "Grazing Act," was continued actively during 1938. The associations are encouraged and officially recognized for the purpose of getting a consensus of opinion on range conditions, range-management from the stockmen's view-point, and any matters of general interest or conflict on the Crown range. As a general rule such associations are of great value to the administrative officers and give their co-operation generously. During 1938 one new association was formed and twenty-three meetings held with twenty-six associations.

Co-operation with the Game Commission has continued on an active and mutually satisfactory basis. Three contentious cases involving the grazing of sheep on high mountain areas were decided on the ground by members of both organizations.

The grazing of live stock undoubtedly has some effect on wild life, the relative amount being the subject of much contrary opinion. The recreational values of forest lands are increasingly recognized and must be balanced against the values derived through the production of live stock. We confidently expect that any differences of opinion that may arise between the stockmen and the sportsmen will be settled on a co-operative basis as were the cases mentioned above.

Beetle-killed pine on summer ranges continues to give trouble. For the past twenty years pine beetles have devastated great areas of lodgepole pine forests in the interior of the Province and as time goes on the dead trees fall in greater and greater numbers. The resulting tangle makes an impenetrable barrier to stock and actually covers up great areas of excellent forage.

This epidemic infestation is still spreading and will continue to reduce the available summer range. Various remedies have been suggested, among them being fire and clearing. Fire results in devastation and ruin of the soil where it is hot enough to remove the dead timber, while clearing on any large scale is too expensive. The most satisfactory solution found has been the cutting of trails through the deadfall areas. These trails allow the stock to get in and out to feed and water and are ameliorating, somewhat, the damage done.

### Market Conditions.

Prices for range beef remained fair during 1938, although the foreign shipments were not up to those of 1937. For various reasons American buyers were not in the Canadian market as strongly as the year before, but the British market took three times as many beef animals. With a lowering of the United States tariff on certain classes of beef by ½-cent per pound, there appears to be a little better outlook in that market for 1939.

Prices throughout 1938 have ranged from 5 cents to 7½ cents per pound live weight for No. 1 steers, with ordinary bringing only 3½ to 4 cents. Good cows brought 3½ to 4 cents, spays and heifers 4 to 5 cents, and poor quality animals as low as 2½ cents per pound.

Good-quality beef comes from well-managed ranges and properly run feed-yards. The difference is in the amount of intelligent work put on the range and animals. The Forest Service has followed the policy of encouragement and assisting ranchers in range-management and the Range Improvement Fund is used for that purpose.

The range-sheep industry in British Columbia is of considerable importance and value, making use of large areas of early, low range and, in summer, the high, sub-alpine meadows and ridges. Quality in lambs and wool count no less than with beef and returns are in accordance therewith.

During 1938 lamb-prices were fair to good, around 6½ cents a pound on the average but running to 8 or 9 cents for better grades. Wool was turned in to the co-operative association with an advance of 5 cents per pound and will probably net another 5 to 7 cents on final sale. Although these prices would show no great profits, they enable the careful rancher to stay solvent.

### Live Stock on Crown Ranges.

During 1938 there were 738 individual grazing-permits issued. A comparison with the numbers of live stock permitted on Crown ranges during the past five years follows:—

| Year. | Cattle and Horses. | Sheep. |
|---|---|---|
| 1934 | 69,960 | 36,569 |
| 1935 | 60,864 | 36,902 |
| 1936 | 77,137 | 46,084 |
| 1937 | 77,451 | 42,185 |
| 1938 | 75,022 | 37,060 |

### Range Improvements.

The Range Improvement Fund, made up of one-third of all grazing fees collected, is used to build such improvements on Crown ranges as will improve the forage in quantity and quality. This involves drift-fences to protect the range; trails to open up new areas; water development to make range usable; mud-hole fencing to make possible the use of range without loss; and experimental work.

During 1938 the sum of $3,234.17 was expended to build or improve 11½ miles of drift-fence; 92 miles of stock trails and driveways; 4 bridges; 1 cattle-guard; 1 bull-pasture; and fence 7 mud-holes. One hundred and forty wild horses were removed from the range.

## PERSONNEL DIRECTORY, 1939.

### Victoria Office.

| | |
|---|---|
| E. C. Manning | Chief Forester. |
| C. D. Orchard | Assistant Chief Forester. |
| G. P. Melrose | Forester—Protection—Grazing. |
| E. E. Gregg | Assistant Forester. |
| R. G. McKee | Assistant Forester. |
| J. H. Blake | Mechanical Superintendent. |
| E. B. Prowd | Forester—Management. |
| S. E. Marling | Assistant Forester. |
| F. S. McKinnon | Forester—Economics. |
| H. J. Hodgins | Assistant Forester. |
| K. C. McCannel | Assistant Forester—Parks and Recreation. |
| S. W. Barclay | Royalty Inspector. |
| H. H. Smith | Chief Accountant. |
| W. L. Thomas | Chief Draughtsman. |

### Districts.

*Vancouver.*

| | |
|---|---|
| C. J. Haddon | District Forester. |
| C. C. Ternan | Assistant District Forester. |
| W. Byers | Supervisor of Scalers. |
| M. Gormley | Assistant Forester. |
| W. S. Hepher | Assistant Forester. |
| D. B. Taylor | Assistant Forester. |
| J. G. MacDonald | Fire Inspector. |
| A. H. Waddington | Fire Inspector. |

*Prince Rupert.*

| | |
|---|---|
| R. C. St. Clair | District Forester. |
| L. S. Hope | Assistant District Forester. |
| J. E. Mathieson | Fire Inspector. |

*Prince George.*

| | |
|---|---|
| R. D. Greggor | District Forester. |
| L. F. Swannell | Assistant District Forester. |

*Kamloops.*

| | |
|---|---|
| A. E. Parlow | District Forester. |
| T. A. Clarke | Assistant District Forester. |
| C. W. Walker | Assistant Forester. |
| C. L. Armstrong | Assistant Forester. |
| J. A. Pedley | Fire Inspector. |
| E. A. Charlesworth | Supervisor of Scalers. |

*Nelson.*

| | |
|---|---|
| R. E. Allen | District Forester. |
| E. W. Bassett | Assistant District Forester. |
| R. R. Douglas | Assistant Forester. |
| W. Holmgren | Fire Inspector. |

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